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UNDERGROUND STORAGE TANK  
ASSESSMENT REPORT

LINDBERG HEAT TREATING COMPANY  
MELROSE PARK, ILLINOIS

PROJECT NO. 87024.03

DECEMBER 1990

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## ACKNOWLEDGEMENT

The tank assessment conducted at 1975 N. Ruby Road, Melrose Park, Illinois was completed in accordance with an established scope of work as defined in Mabbett, Capaccio & Associates, Inc. (MCA) Letter-Agreement dated January 11, 1990, and generally accepted site assessment standards of practice and procedures. The professional opinions and findings presented herein are based on the facts and information conveyed to or observed by MCA during completion of this project. These facts and observations are summarized in the attached report by MCA. If any of the information/facts provided to MCA and used in preparing this report are incorrect, incomplete, or subject to change, MCA would wish to alter its opinion(s) accordingly. In addition, the professional opinions contained in this report are based solely on the laws, regulations, and technical data as known to MCA as of the date of this report and considered applicable to this project.


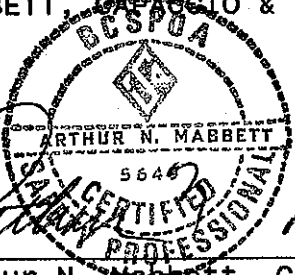
This report was prepared by the following Mabbett, Capaccio & Associates, Inc. personnel:

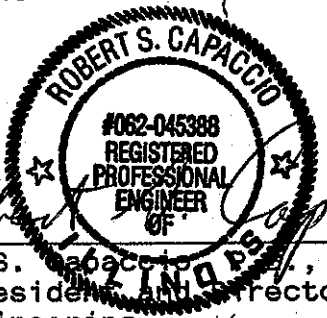
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## I. INTRODUCTION

At the request of Lindberg Heat Treating Company (Lindberg), Mabbett, Capaccio & Associates, Inc. (MCA) conducted an assessment of potential soil and groundwater contamination associated with three underground storage tanks (USTs) at Lindberg's 1975 North Ruby Street, Melrose Park, Illinois facility. The site is located at the intersection of North Ruby Street and Indian Boundary Drive, approximately 2.5 miles east of the Route 294 and Route 64 (North Avenue) intersection (Refer to Figure I-1). The purpose of this investigation was to assess the potential release of quench oil from three USTs located under the "Pump House" area of the Lindberg facility. The investigation was conducted in accordance with the Pump House Sampling Plan outlined in the MCA February 1, 1990 letter to the Illinois Environmental Protection Agency (ILEPA), as approved by the ILEPA March 29, 1990 letter. The soil and groundwater beneath the Pump House and adjacent to the three USTs was assessed in accordance with 40 Code of Federal Register (CFR) Part 280-Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tank; Illinois Underground Storage Tank Regulations Part 731; and ILEPA Guidance Manual for Petroleum-Related LUST Cleanups in Illinois, Spring 1990. The three steel, 10,000 gallon, approximately thirty year old USTs were used to store and/or circulate quench oil for process operations. The tanks of concern, UST Nos. 1, 2 and 3, are housed along with UST Nos. 4 and 5 beneath the Pump House. UST Nos. 4 and 5 are water tanks exempt from regulation (Refer to Figure No. I-2). The investigation included the advancement of seven (7) soil borings, collection of soil samples, installation of five (5) groundwater monitoring wells, and classification and logging of test boring soil samples. A chemical investigation included field screening and laboratory analysis of soil and groundwater samples.

On behalf of Lindberg, MCA made a verbal report to ILEPA of a suspected release of quench oil from USTs at Lindberg's facility on September 8, 1989 (ILEPA Incident No. 891730). Lindberg confirmed the initial report in writing on September 27, 1989. A response to the ILEPA informational request letter dated September 14, 1989 was prepared by MCA and submitted on February 1, 1990. The February 1, 1990 response letter included an update of status regarding initial release confirmation and mitigation efforts, as well as the proposed Pump House Sampling Plan to investigate the suspected release.

The ILEPA approved the Pump House Sampling Plan in a letter dated March 29, 1990. The drilling/well installation specifications were competitively bid and a contractor was selected.

Field activities associated with the UST release assessment were conducted on July 9 through July 13, 1990. Field work included collection of split-spoon soil samples from each of seven borings, located adjacent to the USTs and Pump House. Groundwater samples were collected on September 6, 1990. Soil samples were screened in the field by MCA personnel for total volatile organic compounds (VOCs) using a photoionization meter and delivered to a certified laboratory for total petroleum hydrocarbon (TPH) analysis. VOC analysis was added to the scope of work based on field screening results and observations.

The results of the quantitative laboratory analyses indicated that soil TPH concentrations ranged between non-detectable [less than 40 parts per million (ppm)], equivalent to milligrams per kilogram (mg/kg) in borings B-1, B-5 and B-7; to a maximum value of 65,300 ppm in boring B-4. The total VOC concentration in soil samples ranged from non-detectable (refer to Laboratory Reports, Appendix B, for detection limits) to 188,600 parts per billion (ppb), equivalent to micrograms per kilogram (ug/kg), or less than 0.02 percent total VOCs in boring B-7. The VOCs identified in soil samples included trichloroethene (TCE) and trans-1,2-dichloroethene (t-1,2-DCE).

Groundwater samples collected from the five monitoring wells installed indicated TPH concentrations ranging from non-detectable (less than 0.5 ppm) to a maximum value of 3,346 ppm in monitoring well MCA-2. The total VOCs detected in groundwater samples ranged from non-detectable (refer to Laboratory Reports, Appendix B, for detection limits) to 76,851 ppb in MCA-5. The VOCs identified include: 1,1-dichloroethane (1,1-DCA); tetrachloroethene (Tetra); 1,2-dichloroethane (1,2-DCA); 1,1,1-trichloroethane (1,1,1-TCA); toluene; vinyl chloride; cis-1,2-dichloroethene (c-1, 2-DCE); t-1,2-DCE; and TCE.

MCA utilized four subcontractors to conduct field activities including: concrete coring, subsurface exploratory drilling, a well elevation survey, and laboratory analyses. Accurate Coring of Des Plaines, IL conducted concrete floor coring activities to allow drilling operations to be conducted interior to the building. Concrete floor cores were 10" in diameter and ranged between 7 and 9 inches in thickness, for

a total of 8 cores. D&G Drilling, Inc. of New Lenox, IL was responsible for advancement of seven borings in which five monitoring wells were installed. One boring location was abandoned after advancement of four feet due to auger refusal. Advanced Surveying and Mapping, Inc. (ASM) of Batavia, IL provided an elevation survey showing elevations of the top of the groundwater monitoring wells and steel casings. Alpha Analytical Laboratories of Westborough, MA performed laboratory analytical work on selected soil and groundwater samples.

## II. SUBSURFACE INVESTIGATIONS

### A. Drilling and Soil Sampling

During the week of July 9, 1990, an MCA Environmental Engineer, George L. Olson, observed the advancement of seven (7) subsurface test borings and installation of five (5) groundwater monitoring wells, adjacent to the underground storage tanks (UST Nos. 1, 2, and 3) located beneath the Lindberg facility's Pump House. The Pump House is a room located within Lindberg's facility/manufacturing plant. The borings were drilled using a skid mounted, hollow stem auger rig. Four (4) borings (B-1, B-2, B-3 and B-5) surround and are located immediately outside the Pump House. Two (2) borings were located within the Pump House; boring B-4 between UST Nos. 1 and 2, and boring B-6 between UST Nos. 3 and 4. Boring B-7 was located between the facility's exterior wall and the Pump House's west wall. Refer to Figure I-2 for test boring locations. Borings B-1 through B-6 were located and advanced to determine the horizontal and vertical extent of suspected quench oil contamination as described in the February 1, 1990 MCA letter to the ILEPA. An additional boring, B-7 was installed to further determine the extent of the apparent free product layer of quench oil observed in boring B-3. On behalf of Lindberg, MCA made a verbal report of the apparent free product in B-3 to ILEPA on July 12, 1990. Boring B-1 was advanced to 26 feet below grade; B-2, B-3, B-4, B-6 and B-7 to 13 feet; and B-5 to 20 feet below grade.

Soil samples were collected using a 2-foot long split-spoon sampler. Continuous samples were collected in all borings between 3 and 13 feet below grade (the approximate depth interval of the USTs), and 5 foot intervals thereafter, commencing at 15 feet below grade. Between samples, the split-spoon was decontaminated with an Alconox detergent wash, followed by a methanol rinse and a distilled water rinse. Complete boring logs are included as Appendix A.

Classification of soil at the site indicated fill consisting of gravelly sand with little silt to 3 feet below floor grade and, brown and gray clay with some silt to 26.5 feet (the extent of the deepest boring). Specifically, gravelly sand fill was encountered beneath the eight-inch concrete slab floor to approximately 3 feet below grade. Brown and gray clay, periodically stratified by seams of clay and trace to little sand and



gravel, was encountered in borings B-1, B-3, B-5 and B-7 to thirteen feet below grade (maximum depth of all borings except B-1 and B-5). Borings B-1 and B-5 indicated clay (periodically stratified as described above) to approximately 20.5 feet below grade. At this depth, the subsurface soil became more silty and extended to approximately 26 feet below grade, the bottom of the boring B-1.

Boring samples collected from B-2, B-4 and B-6 consisted of fill material only, apparently due to the subsurface structures (i.e., USTs) in the immediate surroundings. The subsurface soil beneath these structures (i.e., USTs) is anticipated to be natural clay and silt. Borings B-4 and B-6 encountered refusal at 13 feet below grade. The concrete hold-down pads of each UST correspond to this depth, and therefore are anticipated to be the cause of refusal.

All samples were collected by advancing a split-spoon sampler with a 140-pound hammer over a 24-inch vertical drop. The sampler was brought to the surface, split apart and a composite sample was collected. The composite soil samples were obtained by cross-sectioning the split-spoon core sample along its length.

A Photovac, Inc., Total Ionizables Present (TIP) II, photoionization detector was used to screen soil collected during drilling activities at the site. The TIP was used to identify total VOCs with ionization potentials between 0 and 10.2 electron volts (eV). The instrument was calibrated with isobutylene and zero grade air using a 500 milliliter plastic calibration bag before and after each use.

Sample headspace vapor analysis was accomplished by filling a sample container half full with sample, covering the jar with aluminum foil and shaking it for one minute. The sample is allowed to equilibrate to ambient temperature, approximately 80°F, and then analyzed by piercing the foil with the TIP's teflon probe.

The TIP indicated VOC contamination at all locations (Refer to Table 1). However, the correlation between TIP screening results and laboratory analysis is not apparent nor anticipated due to the TIP's qualitative nature. Screening results were used to assist in drilling activities and selecting soil samples for laboratory

analysis. Soil collected from B-3 was observed to be saturated with quench oil. Soil collected from B-7 appeared to emit a solvent-like odor.

Fifteen (15) of thirty-nine (39) soil samples collected were analyzed by Alpha Analytical Laboratories, Inc. of Westborough, MA. The select samples were analyzed for TPHs by EPA Method 418.1 and VOCs by EPA Method 8240. Table 3 presents the laboratory analyses for the select soil samples. The complete laboratory report is also included in Appendix B.

#### B. Monitoring Well Installation

Monitoring wells (MCA-) were installed in five of the seven borings (B-); B-1 (MCA-1), B-3 (MCA-2), B-5 (MCA-3), B-6 (MCA-4), and B-7 (MCA-5). Based on overall area coverage, borings B-2 and B-4 were properly backfilled and do not contain monitoring wells. All wells are constructed of 2-inch inside diameter, 0.010 inch slot, schedule 40 PVC casing to monitor groundwater. Because clay was encountered at a shallow depth in MCA-1, -2, -3 and -5, wells were installed into clay to collect a sufficient quantity of groundwater for sampling/monitoring purposes. Groundwater monitoring wells were installed at the following depth below grade: MCA-1 (9.9 feet), MCA-2 (11.0 feet), MCA-3 (7.7 feet), MCA-4 (10.6 feet) and MCA-5 (7.8 feet). It should be noted that groundwater encountered is perched above the clay beneath the building.

The annular space between the borehole and well screen was backfilled with silica sand to prevent well clogging and enhance well production. A clay seal of bentonite pellets was backfilled above the sand and water table, and another seal was installed below the well to prevent vertical contaminant migration into the deeper portion of the test boring. A protective steel casing was placed over each well and set in concrete. Monitoring well installation reports are included in Appendix A.

#### C. Groundwater Sampling

On September 6, 1990, a groundwater sample was collected from each well. Prior to sampling, each well was purged by removing a minimum of 3 volumes of standing well water using a precleaned teflon bailer. The temperature, pH and conductivity of the groundwater were measured after removing each well volume of water. Similar readings

between well volumes were used as an indication of an adequately purged well. If temperature, pH and conductivity measurements did not stabilize after removing the third well volume, purging was continued until consistent readings were attained. The recharge rate of MCA-4 and MCA-5 did not permit three full well volumes to be removed prior to sampling. However, parameter stabilization was still achieved. Table 1 summarizes the temperature, pH and conductivity of groundwater measured at the site.

After purging, each well was allowed to recharge to at least 75% of its static water level before sampling, with the exception of MCA-5. Based on MCA-5's very slow recharge rate, a 50% static water level was attained prior to sampling. Groundwater was sampled using a precleaned teflon bailer. To prevent cross contamination between wells, the bailer was washed with an Alconox/water solution, followed by a distilled water rinse, methanol rinse and then a final distilled water rinse before purging/sampling.

#### D. Groundwater Flow

Groundwater elevations were measured relative to top-of-PVC casing elevations determined by ASM. Elevations are referenced to City of Melrose Park benchmark numbers 105 and 106, as provided by Mr. Charlie Noel, Edwin Hancock Engineering of Westchester, Illinois. The depth to groundwater at each well was measured on September 6, 1990 by MCA personnel with a Sample Pro, Water Level Meter, Model 6000, a product of Q.E.D. Environmental System, Inc., Ann Arbor, MI. The depth to groundwater ranged between 3 to 7 feet below the floor surface. The depth to groundwater at MCA-1, -2, -3, -4 and -5 was 3.94', 4.36', 3.72', 3.71' and 7.29', respectively. The top-of-casing elevations for MCA-1, -2, -3, -4 and -5 are 634.46', 634.45', 634.51', 634.34' and 634.49', respectively.

The groundwater elevations calculated do not indicate a distinct/prevalent groundwater flow direction. The elevation difference of the perched groundwater may be attributed to subsurface structures (e.g., foundation walls, footings, pits, USTs etc.) and the inconsistent substructure soils (i.e., depth of fill). These subsurface conditions likely restrict the flow rate and extent of the perched groundwater table. The groundwater level and movement is also likely influenced by

precipitation. Review of the soil boring logs and subsurface structures indicates that the natural depth below floor grade to clay is approximately 3 feet. Inspection of boring logs B-2, B-4 and B-6 suggest that when the subsurface structures were installed, excavation of the naturally occurring clay was replaced by these structure and surrounded with a gravelly sand fill, hence, the development of subsurface inconsistencies causing localized collection of groundwater.

Regional topography suggests that the indirect surface water receptor of site run-off and perched groundwater appears to be Silver Creek, although this has not been confirmed. Silver Creek is located approximately 1200 feet northeast of the Lindberg facility and flows southeast to the Des Plaines River. The Des Plaines River flows north to south into the Kankakee River. Based on the regional topography, groundwater in primary aquifer beneath the site (not perched groundwater) is expected to flow east towards the Des Plaines River.

Field activity sheets used during each field activity are included in Appendix C.

### III. LAB RESULTS AND DISCUSSION

The soil and groundwater samples collected at the site during this investigation were sent to Alpha Analytical Laboratories, Inc. (Alpha). Alpha is a certified laboratory for analysis in many states including: Maine, New Hampshire, Massachusetts, New York, Rhode Island and Connecticut. Selected samples were analyzed for TPH by EPA Method 418.1 and VOCs by EPA Method 8240/624. Results are summarized in Table 3. Complete laboratory reports are included in Appendix B.

#### A. TPH Results

TPH soil contamination was indicated in four of the seven borings; B-2, B-3, B-4 and B-6. The maximum TPH soil concentrations measured, ranged between 2,280 ppm in B-3 at the 5-7 foot depth interval, to 65,300 ppm in B-4 at the 3-5 foot depth interval. TPH soil concentrations for soil collected from B-1, B-5 and B-7 are below the detection limit of 40 ppm. Although B-3 (MCA-2) had the lowest concentration of TPH among the borings with TPH contamination, B-3 was the only location where free product (four inches of quench oil) was observed. The free product layer thickness has remained essentially static over the period of September 6, 1990 to October 30, 1990.

In spite of the fact that B-3 is the only well with free product, the reasoning for the low TPH results may be explained by the subsurface soil conditions observed at each location. A shallow clay formation is present at B-3, whereas soil at the other locations with detectable concentrations of TPH (B-2, B-4 and B-6) were entirely gravelly sand fill to 13 feet. The low porosity of clay relative to fill prevents the vertical migration of an oil release and therefore the oil is restricted to the overlying groundwater. Fill, on the other hand, absorbs the oily material and allows the oil to migrate vertically.

Field observations of B-3 indicated that the clay beneath the fill/clay interface did not appear to be saturated with petroleum. Additionally, the petroleum product observed in the soil samples collected from B-3, appeared to be coating the exterior core surface, not saturating the material. This suggests that the auger flights did not seal at the fill/clay interface, thus allowing the petroleum product to be introduced into the sample.

Groundwater sample TPH analyses of monitoring wells MCA-1, -2, -3 and -4 are more indicative of the relative contaminant concentrations at these locations. MCA-1 and MCA-3 did not indicate TPH contamination to the detection limit of 0.5 ppm. TPH contamination in MCA-2 and 4 was detected at 3,346 ppm and 13 ppm, respectively. Monitoring wells were not installed at B-2 and B-4, therefore groundwater quality data is not available at those two locations.

#### B. VOC Results

VOC contamination was detected in soils collected from B-2, B-3 and B-7. Boring B-1 and B-5 soil samples were below the detection limits for each of the analytical compounds. Boring B-4 and B-6 soils were not analyzed for VOCs based on their locations in relation to the other borings. TCE was detected in soils from B-2, B-3 and B-7 at concentrations of 100 ppb, 230 ppb and 180,000 ppb, respectively. One other VOC, t-1,2-DCE was also detected in soil collected from B-7.

Groundwater samples collected from all monitoring wells on September 6, 1990 indicated VOC contamination with the exception of MCA-4 (located inside the Pump House). The primary contaminant of the perched groundwater in this area is TCE and its biodegradation products including c-1,2-DCE, t-1,2-DCE and vinyl chloride. Other compounds detected include; 1,1-DCA, Tetra, 1,2-DCA and toluene. Monitoring well MCA-5, the most VOC contaminated well, indicated a total VOC concentration of 76,852 ppb, of which 99.8 percent, or 76,700 ppb of the contamination is attributable to TCE (41,000 ppb) and its three biodegradation products (35,700 ppb). The other four contaminants; 1,1-DCA, Tetra, 1,2-DCA and toluene comprise the remaining 0.2 percent or 152 ppb. MCA-1 indicated VOC contamination including TCE (2.1 ppb), c-1,2-DCE (88 ppb) and t-1,2-DCE (3.0 ppb). MCA-2 groundwater analysis detected TCE (11 ppb) and 1,1,1-TCA (38 ppb). MCA-2 is the only well containing 1,1,1-TCA. MCA-3 indicated one compound, c-1,2-DCE at 19 ppb. MCA-4 did not indicate detectable concentrations of any VOC.

The U.S. Environmental Protection Agency (EPA) and the ILEPA have not established groundwater quality standards for VOCs for comparative purposes. The perched groundwater is not used for process operations nor drinking water at the site.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

##### A. Conclusions

Based on field observations, perched groundwater quality and the data presented herein, a release of quench oil, TCE and other VOCs to sub-foundation soil and groundwater has occurred. It is likely that quench oil release(s) were associated with UST and underground piping failure. TCE/solvent release(s) were likely associated with past inadvertent spills from above ground solvent storage and/or process operations, and not with USTs.

Quench oil contamination of subsurface soil and perched groundwater beneath the Pump House and adjacent to UST Nos. 1, 2 and 3 has been confirmed by field observation and laboratory analysis. Quench oil is a petroleum hydrocarbon mixture used to cool heat treated metal parts associated with process work at this facility. Quench oil is a relative inert petroleum mixture characterized by; a boiling point between 550 - 600°F, a flash point of approximately 375°F, specific gravity of less than 1, and negligible vapor pressure and water solubility at standard temperature. The presence of quench oil contamination in the soil and perched groundwater beneath the Pump House [B-4 and B-6 (MW-4)] confirms a release from UST Nos. 2 and 3 and/or associated underground piping. Tank interior inspections conducted on November 17, 1989 revealed two small diameter holes (less than 1/2 inch in diameter) in UST Nos. 2 and 3. UST Nos. 2 and 3 were taken out of service at that time. Although UST No. 1 was observed to be in good structural condition, it was removed from service on December 22, 1989 as a precautionary measure.

Quench oil contamination of soil and perched groundwater is also apparent immediately west of the Pump House beneath the facility's manufacturing floor, as illustrated by the presence of free phase quench oil (4 inches) on the perched groundwater table in MCA-2. It is likely that the release was associated with the Pump House UST's fill pipeline or an underground return pipeline to the Pump House USTs, from previously closed open top tanks located approximately 40 feet to the southwest (Refer to Figure I-2).

Although MCA-2 indicated free product (quench oil), groundwater recovery activities are not anticipated based on hydrogeologic conditions. These conditions include: a perched groundwater table at approximately 3 feet below grade; a thick clay layer which severely restricts vertical contaminant migration; and subsurface structures, coupled with the clay overburden, appear to confine the free product to a limited area adjacent to MCA-2, beneath the building foundation.

Boring B-7 (MCA-5) was originally intended to determine the extent of free phase quench oil contamination observed at B-3 (MCA-2). Quench oil was not observed in B-7 (as confirmed by laboratory analysis), however, a solvent odor was observed in the test boring soil samples, thus necessitating VOC analysis. The laboratory analysis indicated VOC contamination of the groundwater and soil samples from all boring locations with the exception of B-6 (MCA-4). Although the total VOC concentration at MCA-5 was detected at 188,600 ppb (less than 0.02 percent), analyses of other boring locations indicated considerably lower and even nondetectable VOC concentrations. The other borings are located relatively close to B-7, approximately 60 to 130 feet east. All monitoring wells are installed interior to the building and monitor the perched groundwater beneath the building foundation. This suggests that the hydrogeologic site conditions restrict contaminant migration both vertically and horizontally to a substantial degree.

Initial inquiries with Lindberg personnel and the review of available documentation has not confirmed the solvent source or quantity released. However, based on the information examined, the most likely source of solvent contamination appears to be inadvertent spillage of minor quantities over the life of the facility. Additionally, VOC/solvent use is not associated with the Pump House operations or any UST on site. The use of TCE as a degreasing solvent at the Lindberg facility was discontinued in April 1987. The chemical compound 1,1,1-TCA replaced TCE at that time and is currently in use.

Based on available data, and review of existing Federal and Illinois laws and regulations, the nature of the TCE release does not subject it to regulatory notification requirements. The TCE release was not associated with UST operations and therefore is not subject to UST release reporting requirements. Nor is the release subject to Comprehensive Environmental Response



Compensation and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA) reporting requirements, because a reportable quantity of 100 pounds TCE within a 24 hour period cannot be confirmed and the Lindberg property is not operated as a Treatment, Storage and Disposal Facility (TSDF). However, due to the existence of TCE in subsurface soil and perched groundwater beneath the facility's foundation, and in keeping with environmental policy, Lindberg wishes to provide this information to ILEPA in good faith.

B. Recommendations

Based on the information summarized herein, MCA recommends completion of the following additional investigative activities to more clearly define the extent of free phase quench oil adjacent to MCA-2 and the necessity of free product recovery.

1. Install 2 additional monitoring wells. Monitoring wells (MCA-6 and 7) located north and south of MCA-2, advanced to an approximate depth of 10 feet, to define the extent of free product (quench oil) in the vicinity of MCA-2. The additional information collected from MCA-6 and MCA-7 will assist in determining the need for installing and operating a free product recovery system.
2. Sample the newly installed wells, resample selected existing wells, select soil samples from the newly installed test borings, for analysis of TPH by EPA Method 418.1.
3. Tie-in newly installed wells with the existing elevation survey and measure the depth to groundwater, to attempt to determine the prevalent site perched groundwater flow gradient.
4. Analyze the existing and new data upon completion of the above activities, and prepare a report to present the results and recommendations for ILEPA review and approval.

TABLE 1  
SUMMARY OF SOIL SCREENING RESULTS<sup>1</sup>

<u>Boring Location</u>	<u>Sample Designation</u>	<u>Depth Interval (ft)</u>	<u>Total VOCs (ppm)</u>
B-1	SS-1	3 - 5	4
	SS-2	5 - 7	3
	SS-3	7 - 9	4
	SS-4	9 - 11	5
	SS-5	11 - 13	5
	SS-6	15 - 17	5
	SS-7	19 - 21	5
	SS-8	24 - 26	4
B-2	SS-1	3 - 5	300(3)
	SS-2	5 - 7	200(3)
	SS-3	7 - 9	210(3)
	SS-4	9 - 11	210(3)
	SS-5	11 - 13	210(3)
B-3	SS-1	3 - 5	175
	SS-2	5 - 7	50
	SS-3	7 - 9	64
	SS-4	9 - 11	35
	SS-5	11 - 13	15
B-4	SS-1	3 - 5	54
	SS-2	5 - 7	125
	SS-3	7 - 9	90
	SS-4	9 - 11	50
	SS-5	11 - 13	50
B-5	SS-1	3 - 5	190(3)
	SS-2	5 - 7	150(3)
	SS-3	7 - 9	75(3)
	SS-4	9 - 11	145(3)
	SS-5	11 - 13	88(3)
	SS-6	19 - 21	NA
B-6	SS-1	3 - 5	NR
	SS-2	5 - 7	40
	SS-3	7 - 9	37
	SS-4	9 - 11	32
	SS-5	11 - 13	31

TABLE 1  
SUMMARY OF SOIL SCREENING RESULTS<sup>1</sup>  
(Continued)

<u>Boring Location</u>	<u>Sample Designation</u>	<u>Depth Interval (ft)</u>	<u>Total VOCs (ppm)</u>
B-7	SS-1	3 - 5	(4)
	SS-2	5 - 7	(4)
	SS-3	7 - 9	(4)
	SS-4	9 - 11	(4)
	SS-5	11 - 13	(4)

NOTES:

NA - Not Analyzed.

NR - No Split-Spoon Recovery

1. VOC qualitative screening was completed within one hour of collection, on the day of sample collection (July 9-13, 1990) by MCA personnel.
2. ppm - parts total volatile organic compounds per million parts of sample headspace atmosphere.
3. Screening VOC concentrations are presumed incorrect due to excessive water vapor interference within the sample headspace on the screening instrument's (TIP's) detection component.
4. Screening was not conducted based on observed apparent solvent content.

TABLE 2  
SUMMARY OF GROUNDWATER SCREENING RESULTS

<u>Well No. &amp; Volume</u>	<u>Well Volumes Purged</u>	<u>Temperature (°C)</u>	<u>Conductivity (umhos/cm<sup>2</sup>)</u>	<u>pH(s.u.)</u>
MCA-1 (0.97 gal)	1	24.9	1030	6.84
	2	24.3	1030	6.96
	3	24.3	1025	6.92
MCA-2 (1.09 gal)	1	27.1	1040	6.86
	2	27.1	1000	6.91
	3	27.2	1020	6.92
MCA-3 (0.64 gal)	1	26.8	1120	7.03
	2	27.4	1120	7.14
	3	25.7	1110	7.06
MCA-4 (1.04 Gal)	1	28.1	900	7.11
	2	25.8	885	7.23
	3	25.8	870	7.20
MCA-5 (0.14 gal)	1	28.3	3580	7.03
	2	28.2	3520	6.99
	3	28.5	3500	7.23

- NOTES:
1. Groundwater screening and sampling was conducted September 6, 1990.
  2. Conductivity and pH meters were calibrated in the field.
  3. Conductivity measurements are corrected to 25°C.

TABLE 3  
SUMMARY OF LABORATORY RESULTS

LINDBERG HEAT TREATING COMPANY  
1975 N. RUBY STREET, MELROSE PARK, IL  
PROJECT NUMBER 87024.03

I. TOTAL PETROLEUM HYDROCARBON ANALYSES: EPA METHOD 418.1

B/MW LOCATION	SOIL SAMPLE DEPTH (ft)	GROUNDWATER (mg/L)	SOIL (mg/L)
B-1(MCA-1)	3-5	LT 0.5	LT 40
B-2	5-7	NA	11,800
B-3(MCA-2)	5-7	3,346(1)	2,280
B-4	3-5	NA	65,300
B-5(MCA-3)	ALL DEPTHS	LT 0.5	LT 40
B-6(MCA-4)	11-13	13	4,180
B-7(MCA-5)	3-5	NA	LT 40

Lindberg Heat Treating Company  
87024.03

December 1990  
Page 1 of 5  
87024.WK1 (10)

TABLE 3  
SUMMARY OF LABORATORY RESULTS

LINDBERG HEAT TREATING COMPANY  
1975 N.RUBY STREET, MELROSE PARK, IL  
PROJECT NUMBER 87024.03  
(Continued)

II. VOLATILE ORGANIC ANALYSIS: DETECTED COMPOUNDS BY EPA METHOD 624/8240

WELL LOCATION	SOIL SAMPLE DEPTH (ft)	CHEMICAL COMPOUND	GROUNDWATER (ug/L)	SOIL (ug/L)
B-1 (MCA-1)	3-5	1,1-DICHLOROETHANE	LT 4.7	LT 235
		TETRACHLOROETHENE	LT 4.1	LT 205
		1,2-DICHLOROETHANE	LT 2.8	LT 140
		1,1,1-TRICHLOROETHANE	LT 3.8	LT 190
		TOLUENE	LT 6.0	LT 300
		VINYL CHLORIDE	LT 6.5	LT 325
		TRANS 1,2-DICHLOROETHENE	3.0	LT 80
		CIS 1,2-DICHLOROETHENE	88	LT 80
		TRICHLOROETHENE	2.1	LT 95
B-2	5-7	1,1-DICHLOROETHANE	NA	LT 235
		TETRACHLOROETHENE	NA	LT 205
		1,2-DICHLOROETHANE	NA	LT 140
		1,1,1-TRICHLOROETHANE	NA	LT 190
		TOLUENE	NA	LT 300
		VINYL CHLORIDE	NA	LT 325
		TRANS 1,2-DICHLOROETHENE	NA	LT 80
		CIS 1,2-DICHLOROETHENE	NA	LT 80
		TRICHLOROETHENE	NA	100

Lindberg Heat Treating Company  
87024.03

December 1990  
Page 2 of 5  
87024.WK1

TABLE 3  
ANALYTICAL SUMMARY

LINDBERG HEAT TREATING COMPANY  
1975 N.RUBY STREET, MELROSE PARK, IL  
PROJECT NUMBER 87024.03  
(Continued)

II. VOLATILE ORGANIC ANALYSIS: DETECTED COMPOUNDS BY EPA METHOD 624/8240

WELL LOCATION	SOIL SAMPLE DEPTH (ft)	CHEMICAL COMPOUND	GROUNDWATER (ug/L)	SOIL (ug/L)
B-3 (MCA-2)	5-7	1,1-DICHLOROETHANE	LT 23.5	LT 235
		TETRACHLOROETHENE	LT 20.5	LT 205
		1,2-DICHLOROETHANE	LT 14	LT 140
		1,1,1-TRICHLOROETHANE	38	LT 190
		TOLUENE	LT 30	LT 300
		VINYL CHLORIDE	LT 32.5	LT 325
		TRANS 1,2-DICHLOROETHENE	LT 8	LT 80
		CIS 1,2-DICHLOROETHENE	LT 8	LT 80
		TRICHLOROETHENE	11	230
B-4	3-5	1,1-DICHLOROETHANE	NA	NA
		TETRACHLOROETHENE	NA	NA
		1,2-DICHLOROETHANE	NA	NA
		1,1,1-TRICHLOROETHANE	NA	NA
		TOLUENE	NA	NA
		VINYL CHLORIDE	NA	NA
		TRANS 1,2-DICHLOROETHENE	NA	NA
		CIS 1,2-DICHLOROETHENE	NA	NA
		TRICHLOROETHENE	NA	NA

TABLE 3  
ANALYTICAL SUMMARY

LINDBERG HEAT TREATING COMPANY  
1975 N.RUBY STREET, MELROSE PARK, IL  
PROJECT NUMBER 87024.03  
(Continued)

II. VOLATILE ORGANIC ANALYSIS: DETECTED COMPOUNDS BY EPA METHOD 624/8240

WELL LOCATION	SOIL SAMPLE DEPTH (ft)	CHEMICAL COMPOUND	GROUNDWATER (ug/L)	SOIL (ug/L)
B-5 (MCA-3)	ALL DEPTHS	1,1-DICHLOROETHANE	LT 4.7	LT 235
		TETRACHLOROETHENE	LT 4.1	LT 205
		1,2-DICHLOROETHANE	LT 2.8	LT 140
		1,1,1-TRICHLOROETHANE	LT 3.8	LT 190
		TOLUENE	LT 6.0	LT 300
		VINYL CHLORIDE	LT 6.5	LT 325
		TRANS 1,2-DICHLOROETHENE	LT 1.6	LT 80
		CIS 1,2-DICHLOROETHENE	19	LT 80
		TRICHLOROETHENE	LT 1.9	LT 95
B-6 (MCA-4)	11-13	1,1-DICHLOROETHANE	LT 23.5	NA
		TETRACHLOROETHENE	LT 20.5	NA
		1,2-DICHLOROETHANE	LT 14	NA
		1,1,1-TRICHLOROETHANE	LT 19	NA
		TOLUENE	LT 30	NA
		VINYL CHLORIDE	LT 32.5	NA
		TRANS 1,2-DICHLOROETHENE	LT 8	NA
		CIS 1,2-DICHLOROETHENE	LT 8	NA
		TRICHLOROETHENE	LT 9.5	NA

Lindberg Heat Treating Company  
87024.WK1

December 1990  
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87024.WK1



TABLE 3  
ANALYTICAL SUMMARY

LINDBERG HEAT TREATING COMPANY  
1975 N.RUBY STREET, MELROSE PARK, IL  
PROJECT NUMBER 87024.03  
(Continued)

II. VOLATILE ORGANIC ANALYSIS: DETECTED COMPOUNDS BY EPA METHOD 624/8240

WELL LOCATION	SOIL SAMPLE DEPTH (ft)	CHEMICAL COMPOUND	GROUNDWATER (ug/L)	SOIL (ug/L)
B-7 (MCA-5)	3-5	1,1-DICHLOROETHANE	6.0	LT 235
		TETRACHLOROETHENE	120	LT 205
		1,2-DICHLOROETHANE	3.6	LT 140
		1,1,1-TRICHLOROETHANE	LT 3.8	LT 190
		TOLUENE	22	LT 300
		VINYL CHLORIDE	6,600	LT 325
		TRANS 1,2-DICHLOROETHENE	2,100	8,600
		CIS 1,2-DICHLOROETHENE	27,000	LT 80
		TRICHLOROETHENE	41,000	180,000

NOTES: ug/L = Micrograms per liter, equivalent to parts per billion.  
mg/L = Milligrams per liter, equivalent to parts per million.  
NA = Not Analyzed or Not Available.  
B = Boring.  
MW = Monitoring Well.  
LT = Less Than.

(1) Four (4) inches of floating product noted on 9/6/90.

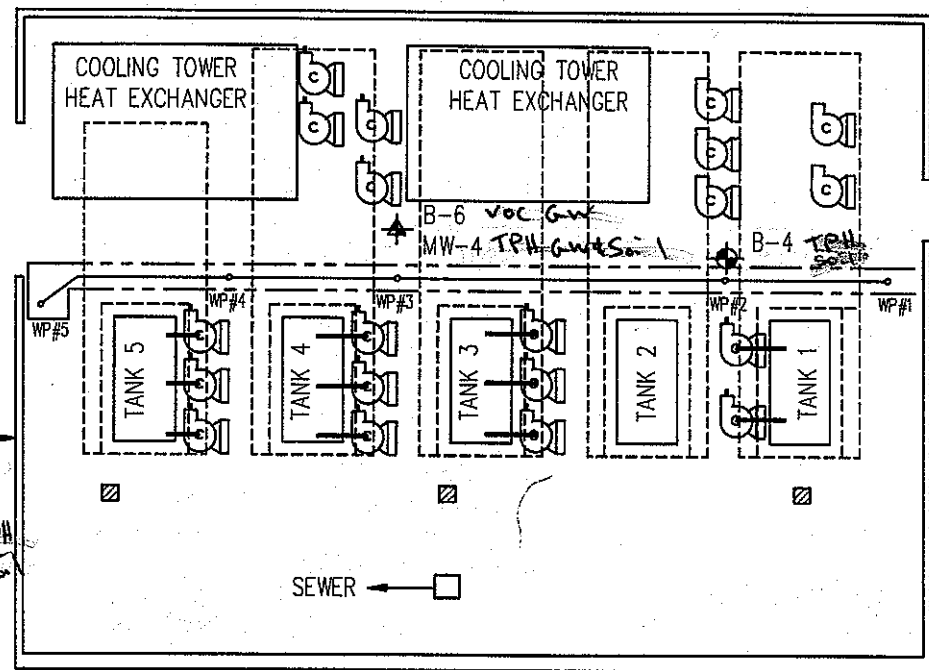
1. All groundwater samples collected on September 6, 1990.
2. Soil samples collected between July 9 & 13, 1990.
3. The soil analytical data should represent the worst case sample from each respective boring as observed/collected by MCA personnel.
4. Analyses conducted by Alpha Analytical Laboratories, Westborough, MA

B-7  
MW-5  
VOC GW & S  
TPH S

B-3  
MW-2  
VOC & TPH  
GW & Soil

# LEGEND

- WP - WELL POINT
- ⊕ - BORING LOCATIONS
- ★ - MONITORING WELL LOCATION



B-1  
MW-1  
TPH & VOC  
for  
GW & Soil

B-2  
VOC & TPH  
for  
Soil

B-5  
MW-3  
TPH & VOC  
GW & Soil

DWG NO.	L-2
PROJ NO.	87024.03

LINDBERG HEAT TREATING CO. MELROSE PARK, ILLINOIS	SAMPLE LOCATION PLAN FIGURE I-3	
	SCALE: 1/8"=1'-0"	DR BY: HSW
MABBETT CAPACCIO & ASSOCIATES, INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle, Bedford, Massachusetts 01730	DATE:	
	AP BY:	

## APPENDIX A

### BORING AND WELL INSTALLATION LOGS



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

PROJECT/CLIENT PUMP HOUSE ASSESSMENT/LINDBERG HEAT TREATING CO. LOCATION MELROSE PARK, IL PROJ. NO. 87024.03  
 BORING LOCATION SEE SITE PLAN (B-1; MCA-1) DATE START/FINISH 07/09/90 / 07/09/90  
 GROUND ELEVATION (NGVD) 634.46' DRILLED BY D & G / B. THOMASSON  
 GROUNDWATER EL./DEPTH 630.52' / 3.94' LOGGED BY GLO DATE 07/09/90

B-1

PG. 1 OF 1

EL. FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
632.46	2						7" CONCRETE SLAB (6" REINFORCED MESH)
							FILL-GRAVELLY SAND (40/60), LITTLE SILT, BROWN.
	4	SS-1	3 4 4 6	24	8	TIP-4 ppm - $\Sigma$	SILTYCLAY - MODERATELY ELASTIC CLAY, TRACE SAND AND FINE GRAVEL, BROWN AND BLACK
	6	SS-2	2 3 4 5	24	24	TIP-3 ppm	SILTYCLAY - MODERATELY ELASTIC CLAY, TRACE SAND AND FINE GRAVEL, BROWN AND BLACK
	8	SS-3	2 3 6 9	24	18	TIP-4 ppm	SILTYCLAY - LOW ELASTICITY, LITTLE WIDELY GRADED GRAVEL BROWN
624.46	10	SS-4	6 9 16 18	24	21	TIP-5 ppm	SILTYCLAY - MODERATELY ELASTIC, TRACE TO LITTLE COARSE GRAVEL, BROWN
	12	SS-5	11 12 23 11	24	18	TIP-5 ppm	SILTYCLAY - MODERATELY ELASTIC, TRACE WIDELY GRADED GRAVEL, BROWN AND GRAY
	14						
	16	SS-6	4 9 11 16	24	24	TIP-5 ppm	SILTYCLAY - MODERATELY ELASTIC, TRACE WIDELY GRADED GRAVEL, BROWN AND GRAY
	18						
614.46	20	SS-7	9 15 28 33	24	20	TIP-5 ppm	CLAY - LOW ELASTICITY, TRACE FINE SAND, GRAY
	22						SANDYSILT - SOME CLAY, GRAY
	24						
	26	SS-8	18 27 30 33	24	22	TIP-4 ppm	CLAYEYSILT - LOW ELASTICITY, TRACE FINE TO MEDIUM GRAVEL, GRAY.
608.46	28						BOTTOM OF BORING - 26' BACKFILLED WITH NATURAL MATERIAL AND SEALED WITH TWO FEET OF BENTONITE AT 10'.
	30						WELL INSTALLED AT APPROXIMATELY 9'-8".

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D. SPLIT SPOON SAMPLER  
 PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
 REC-RECOVERY LENGTH OF SAMPLE  
 SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES > 4 IN./LENGTH CORED, %  
 U-UNDISTURBED SAMPLES  
 $\Sigma$  GROUNDWATER  
 — INTERFACE  
 - - - APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-8050

PROJECT/CLIENT PUMP HOUSE ASSESSMENT/LINDBERG HEAT TREATING CO. LOCATION MELROSE PARK, IL PROJ. NO. 87024.03  
 BORING LOCATION SEE SITE PLAN (B-2) DATE START/FINISH 07/13/90 / 07/13/90  
 GROUND ELEVATION (NGVD) NA DRILLED BY D & G / B. THOMASSON  
 GROUNDWATER EL./DEPTH NA - NO WELL INSTALLED LOGGED BY GLO DATE 07/13/90

B-2

PG. 1 OF 1

EL. FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
							8" CONCRETE SLAB (6" REINFORCED MESH)
1							FILL - WIDELY GRADED SANDY GRAVEL, BROWN
2							
3			3				
4		SS-1	2	24	2	TIP-300 ppm*	FILL - WIDELY GRADED SANDY GRAVEL, LITTLE CLAY, GRAYISH BROWN.
			3				
5			3				
			2				
6		SS-2	2	24	6.5	TIP-200 ppm*	FILL - WIDELY GRADED GRAVELLY SAND, LITTLE CLAY, GRAYISH BROWN.
			2				
7			3				
			4				
8		SS-3	4	24	5	TIP-210 ppm*	FILL - WIDELY GRADED GRAVELLY SAND, LITTLE SILTY CLAY, GRAYISH BROWN.
			4				
9			2				
			28				
10		SS-4	14	24	16	TIP-210 ppm*	FILL - WIDELY GRADED GRAVELLY SAND, SOME SILT, GRAYISH BROWN.
			6				
11			12				
			7				
12		SS-5	8	24	10.5	TIP-210 ppm*	FILL - SIMILAR TO SS-4
			6				
13			3				
14							BOTTOM OF BORING - 13'. BACKFILLED WITH NATURAL MATERIAL. NO MONITORING WELL INSTALLED.
15							

BLOWS PER 6" -140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D.  
SPLIT SPOON SAMPLER

PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL

REC-RECOVERY LENGTH OF SAMPLE

SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES >4 IN./LENGTH CORED, %

U-UNDISTURBED SAMPLES

 GROUNDWATER

 INTERFACE

 APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

PROJECT/CIENT PUMP HOUSE ASSESSMENT/LINDBERG HEAT TREATING CO. LOCATION MELROSE PARK, IL PROJ. NO. 87024.03

BORING LOCATION SEE SITE PLAN (B-3.MCA-2)

DATE START/FINISH 07/10/90 / 07/10/90

B-3

GROUND ELEVATION (NGVD) 634.45'

DRILLED BY D & G / B. THOMASSON

GROUNDWATER EL./DEPTH 630.09' / 4.36'

LOGGED BY GLO DATE 07/10/90

PG. 1 OF 1

EL. FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
633.45	1						8" CONCRETE SLAB (6" REINFORCED MESH)
	2						FILL - WIDELY GRADED SANDY GRAVEL, BROWN
	3						
	4	SS-1	1 1 2	24	10	TIP-175ppm-	SILTY CLAY - MODERATELY ELASTIC, LITTLE FINE TO MEDIUM SAND AND COARSE GRAVEL, BROWN AND BLACK.
629.45	5		3				
	6	SS-2	1 1 1	24	5.5	TIP-50ppm	SILTY CLAY - MODERATELY ELASTIC, TRACE WIDELY GRADED SAND AND GRAVEL, BROWN AND BLACK.
	7						
	8	SS-3	3 4 6 12	24	22	TIP-64ppm	SILTY CLAY - MODERATELY ELASTIC, LITTLE MEDIUM TO COARSE SAND, GRAY.
	9						
624.45	10	SS-4	6 8 14 16	24	24	TIP-35ppm	SILTY CLAY - LOW ELASTICITY, LITTLE FINE TO MEDIUM SAND, TRACE WIDELY GRADED GRAVEL, BROWN AND GRAY.
	11						
	12	SS-5	7 13 15 17	24	18	TIP-15ppm	SILTY CLAY - SIMILAR TO SS-4
	13						
620.45	14						BOTTOM OF BORING - 13'. BACKFILLED AND SEALED WITH BENTONITE AT 11 FEET. WELL INSTALLED AT APPROXIMATE 10'-8".
	15						

BLOWS PER 6" -140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D. SPLIT SPOON SAMPLER

PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL

REC-RECOVERY LENGTH OF SAMPLE

SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES >4 IN./LENGTH CORED, X

U-UNDISTURBED SAMPLES

GROUNDWATER

INTERFACE

APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

PROJECT/CUENT PUMP HOUSE ASSESSMENT/LINDBERG HEAT TREATING CO. LOCATION MELROSE PARK, IL PROJ. NO. 87024.03  
 BORING LOCATION SEE SITE PLAN (B-4) DATE START/FINISH 07/11/90 / 07/11/90  
 GROUND ELEVATION (NGVD) NA DRILLED BY D & G / B. THOMASSON  
 GROUNDWATER EL./DEPTH NA - NO WELL INSTALLED LOGGED BY GLO DATE 07/11/90

B-4

PG. 1 OF 1

EL. FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
							8.5" CONCRETE SLAB (6" REINFORCED MESH)
1							FILL - WIDELY GRADED GRAVELLY SAND, LITTLE SILT, BLACK, GRAY AND BROWN.
2							
3			1				
4		SS-1	2	24	7	TIP-54ppm -	FILL - WIDELY GRADED GRAVELLY SAND, LITTLE SILT, BLACK, GRAY AND BROWN.
5			2				
6		SS-2	2	24	<1	SOIL SATURATED WITH QUENCH OIL TIP-125ppm	FILL - SIMILAR TO SS-1
7			4				
8		SS-3	9	24	13	TIP-90ppm	FILL - WIDELY GRADED GRAVELLY SAND, LITTLE SILTY CLAY, BROWN AND DARK GRAY.
9			9				
10		SS-4	2	24	1	TIP-50ppm	FILL - WIDELY GRADED SANDY GRAVEL, TRACE SILT, BROWN.
11			4				
12		SS-5	7				
13			8	24	20	TIP-50ppm	FILL - SIMILAR TO SS-4
14			12				
15			8				
			13				
			15				
							AUGER REFUSAL AT 13'. SUSPECTED CONCRETE HOLD-DOWN PAD. BACKFILLED WITH NATURAL MATERIAL. NO WELL INSTALLED.

BLOWS PER 6" -140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D. SPLIT SPOON SAMPLER  
 PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
 REC-RECOVERY LENGTH OF SAMPLE  
 SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES >4 IN./LENGTH CORED, X  
 U-UNDISTURBED SAMPLES  
 GROUNDWATER  
 INTERFACE  
 APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

PROJECT/CLIENT PUMP HOUSE ASSESSMENT/LINDBERG HEAT TREATING CO.

LOCATION MELROSE PARK, IL

PROJ. NO. 87024.03

B-5

BORING LOCATION SEE SITE PLAN (B-5, MCA-3)

DATE START/FINISH 07/12/90 / 07/12/90

GROUND ELEVATION (NGVD) 634.51'

DRILLED BY D & G / B. THOMASSON

GROUNDWATER EL./DEPTH 630.79' / 3.72'

LOGGED BY GLO

DATE 07/12/90

PG. 1 OF 1

EL. FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
632.51	2						7" CONCRETE SLAB (6" REINFORCED MESH)
							FILL - SANDY SILT, SOME COARSE GRAVEL AND CLAY, BLACK AND BROWN.
	4	SS-1	4 7 7 6	24	19	TIP-190ppm*	FILL - WIDELY GRADED SANDY CLAY, SOME SILT, BLACK
							SILTY CLAY - MODERATELY ELASTIC, TRACE FINE TO MEDIUM SAND, BROWN AND GRAY.
	6	SS-2	1 2 3 4	24	17	TIP-150ppm*	SILTY CLAY - MODERATELY ELASTIC, TRACE FINE TO MEDIUM SAND, BROWN AND GRAY.
	8	SS-3	4 5 8 9	24	20	TIP-75ppm*	SILTY CLAY - MODERATELY ELASTIC, TRACE FINE SAND AND GRAVEL, BROWN.
624.51	10	SS-4	6 8 11 13	24	24	TIP-145ppm*	SILTY CLAY - MODERATELY ELASTIC, SOME WIDELY GRADED SAND AND FINE GRAVEL, BROWN
							SILTY CLAY - LOW ELASTICITY, TRACE TO LITTLE WIDELY GRADED SAND AND GRAVEL, TRACE SHALE, BROWN AND GRAY.
	12	SS-5	11 13 21 25	24	24	TIP-88ppm*	SILTY CLAY - LOW ELASTICITY, TRACE TO LITTLE WIDELY GRADED SAND AND GRAVEL, TRACE SHALE, BROWN AND GRAY.
	14						
	16						SILTY CLAY - SIMILAR TO SS-5, BECOMING MORE ELASTIC WITH DEPTH.
	18						
614.51	20	SS-6	4 10 22 22	24	24	TIP-NA	SILTY CLAY - MODERATELY TO HIGHLY ELASTIC, TRACE TO LITTLE WIDELY GRADED GRAVEL, GRAY.
	22						BOTTOM OF BORING - 21' BACKFILLED WITH NATURAL FILL, 2' BENTONITE SEAL INSTALLED TO 8'. WELL INSTALLED AT APPROXIMATELY 7'-8'.
	24						
	26						
	28						
	30						

\* - PRESUMED INCORRECT

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D. SPLIT SPOON SAMPLER

PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL

REC-RECOVERY LENGTH OF SAMPLE

SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES >4 IN./LENGTH CORED, %

U-UNDISTURBED SAMPLES

— GROUNDWATER

— INTERFACE

— — APPROXIMATE INTERFACE






# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-8050

PROJECT/CLIENT PUMP HOUSE ASSESSMENT/LINDBERG HEAT TREATING CO. LOCATION MELROSE PARK, IL PROJ. NO. 87024.03  
 BORING LOCATION SEE SITE PLAN (B-6; MCA-4) DATE START/FINISH 07/11/90 / 07/11/90  
 GROUND ELEVATION (NGVD) 634.34' DRILLED BY D & G / B. THOMASSON  
 GROUNDWATER EL./DEPTH 630.63' / 3.71' LOGGED BY GLO DATE 07/11/90

B-6

PG. 1 OF 1

EL FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
633.34	1						8" CONCRETE SLAB (6" REINFORCED MESH)
	2						
	3						
	4	SS-1	2 2 1 1	24	0	TIP-NA- 	FILL - SANDY SILT, LITTLE WIDELY GRADED GRAVEL, BROWN.
629.34	5		2				
	6	SS-2	3 3 5	24	4	TIP-40ppm	FILL - MEDIUM SAND, LITTLE WIDELY GRADED GRAVEL AND SILT, LIGHT BROWN.
	7		3				
	8	SS-3	5 7 8	24	16	TIP-37ppm	FILL - WIDELY GRADED SANDY GRAVEL, LITTLE SILT, GRAYISH BROWN.
	9						
624.34	10	SS-4	2 3 4 6	24	13	TIP-32ppm	FILL - WIDELY GRADED SANDY GRAVEL, TRACE SILT, BROWN.
	11						
	12	SS-5	2 5 7 15	24	20	TIP-31ppm	FILL - WIDELY GRADED GRAVELLY SAND, TRACE SILT, LIGHT BROWN.
621.34	13						AUGER REFUSAL AT 13'. SUSPECTED CONCRETE HOLD-DOWN PADS. WELL INSTALLED AT APPROXIMATELY 9'-9"
	14						
	15						

BLOWS PER 6" -140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D.  
SPLIT SPOON SAMPLER

PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL

REC-RECOVERY LENGTH OF SAMPLE

SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES >4 IN./LENGTH CORED,%

U-UNDISTURBED SAMPLES

 GROUNDWATER

 INTERFACE

 APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

PROJECT/CLIENT PUMP HOUSE ASSESSMENT/LINDBERG HEAT TREATING CO. LOCATION MELROSE PARK, IL PROJ. NO. 87024.03

BORING LOCATION SEE SITE PLAN (B-7; MCA-5)

DATE START/FINISH 01/13/90 / 07/13/90

B-7

GROUND ELEVATION (NGVD) 634.49'

DRILLED BY D & G / B. THOMASSON

GROUNDWATER EL./DEPTH 627.20' / 7.29'

LOGGED BY GLO DATE 07/13/90

PG. 1 OF 1

EL. FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
633.49	1						8" CONCRETE SLAB (6" REINFORCED MESH)
	2						
	3		2				
	4	SS-1	5	24	20	TIP-NA	SILTY CLAY - MODERATELY ELASTIC, LITTLE WIDELY GRADED SAND AND GRAVEL, BROWN.
			4				
629.49	5		6				
			1				
	6	SS-2	2	24	20	TIP-NA	SILTY CLAY - SIMILAR TO SS-1
			4				
			5				
	7		3				
			7				
	8	SS-3	12	24	24	TIP-NA	SILTY CLAY - MODERATELY ELASTIC, TRACE FINE SAND AND WIDELY GRADED GRAVEL, BROWN.
			15				
	9		4				
624.49	10	SS-4	11	24	20	TIP-NA	SILTY CLAY - MODERATELY ELASTIC, TRACE FINE SAND, BROWN AND GRAY.
			15				
	11		17				
			6				
	12	SS-5	12	24	24	TIP-NA	SILTY CLAY - MODERATELY ELASTIC, TRACE FINE SAND AND WIDELY GRADED GRAVEL, BROWN AND GRAY.
			17				
			19				
621.49	13						BOTTOM OF BORING - 13' BACKFILLED AND SEALED WITH BENTONITE TO APPROXIMATELY 8'. WELL INSTALLED AT APPROXIMATELY 7'-9.5"
	14						
	15						

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D. SPLIT SPOON SAMPLER

PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL

REC - RECOVERY LENGTH OF SAMPLE

SS - SPLIT SPOON SAMPLE

ROD - LENGTH OF SOUND CORES > 4 IN./LENGTH CORED, X

U - UNDISTURBED SAMPLES

— GROUNDWATER

— INTERFACE

— — APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERG HEAT TREATING CO. PROJ. NO. 87024.03

LOCATION 1975 N. RUBY ST. MELROSE PARK, IL

CONTRACTOR D & G DRILLING

DRILLER B. THOMASSON

LOGGED BY GLO

DATE 07/09/90

CHECKED BY \_\_\_\_\_

DATE \_\_\_\_\_

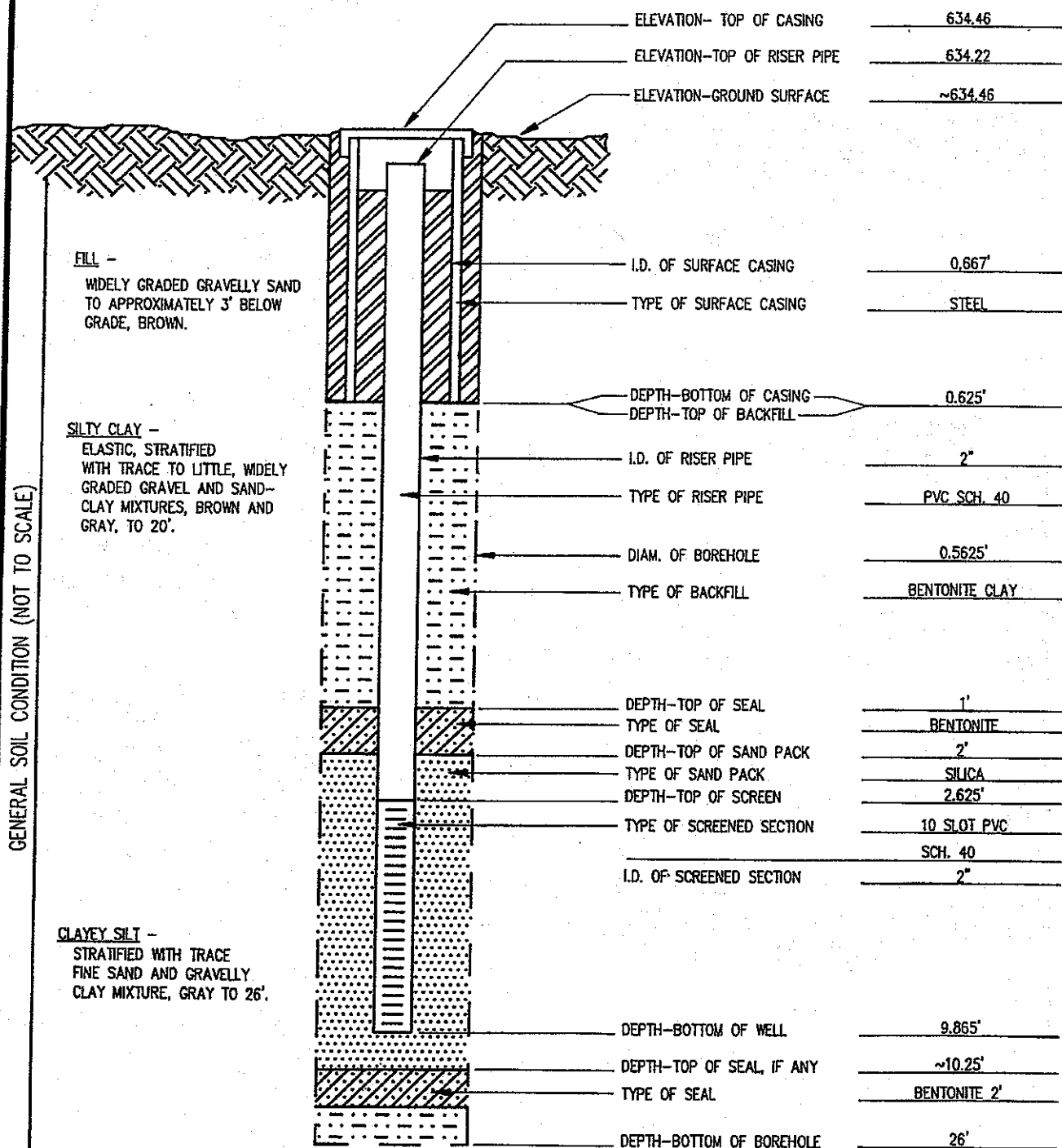
MCA-1

PG. 1 OF 1

BORING NO. B-1

LOCATION SEE SITE

PLAN





# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERG HEAT TREATING CO. PROJ. NO. 87024.03

LOCATION 1975 N. RUBY ST. MELROSE PARK, IL.

CONTRACTOR D & G DRILLING

DRILLER B. THOMASSON

LOGGED BY GLO

DATE 07/13/90

CHECKED BY \_\_\_\_\_

DATE \_\_\_\_\_

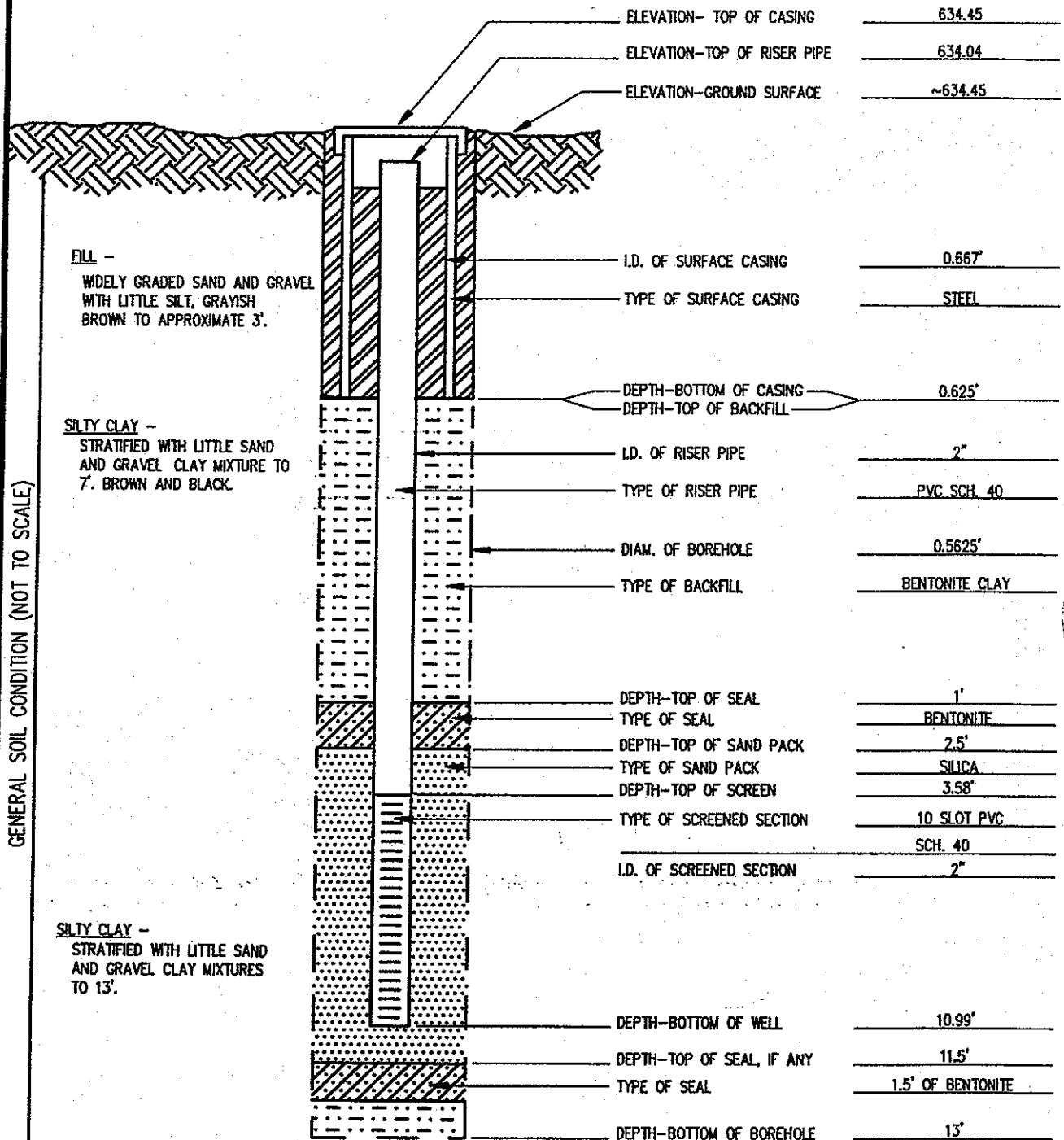
MCA-2

PG. 1 OF 1

BORING NO. B-3

LOCATION SEE SITE

PLAN





# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-6050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERG HEAT TREATING CO. PROJ. NO. 87024.03

LOCATION 1975 N. RUBY ST. MELROSE PARK, IL

CONTRACTOR D & G DRILLING DRILLER B. THOMASSON

LOGGED BY GLO DATE 07/12/90

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

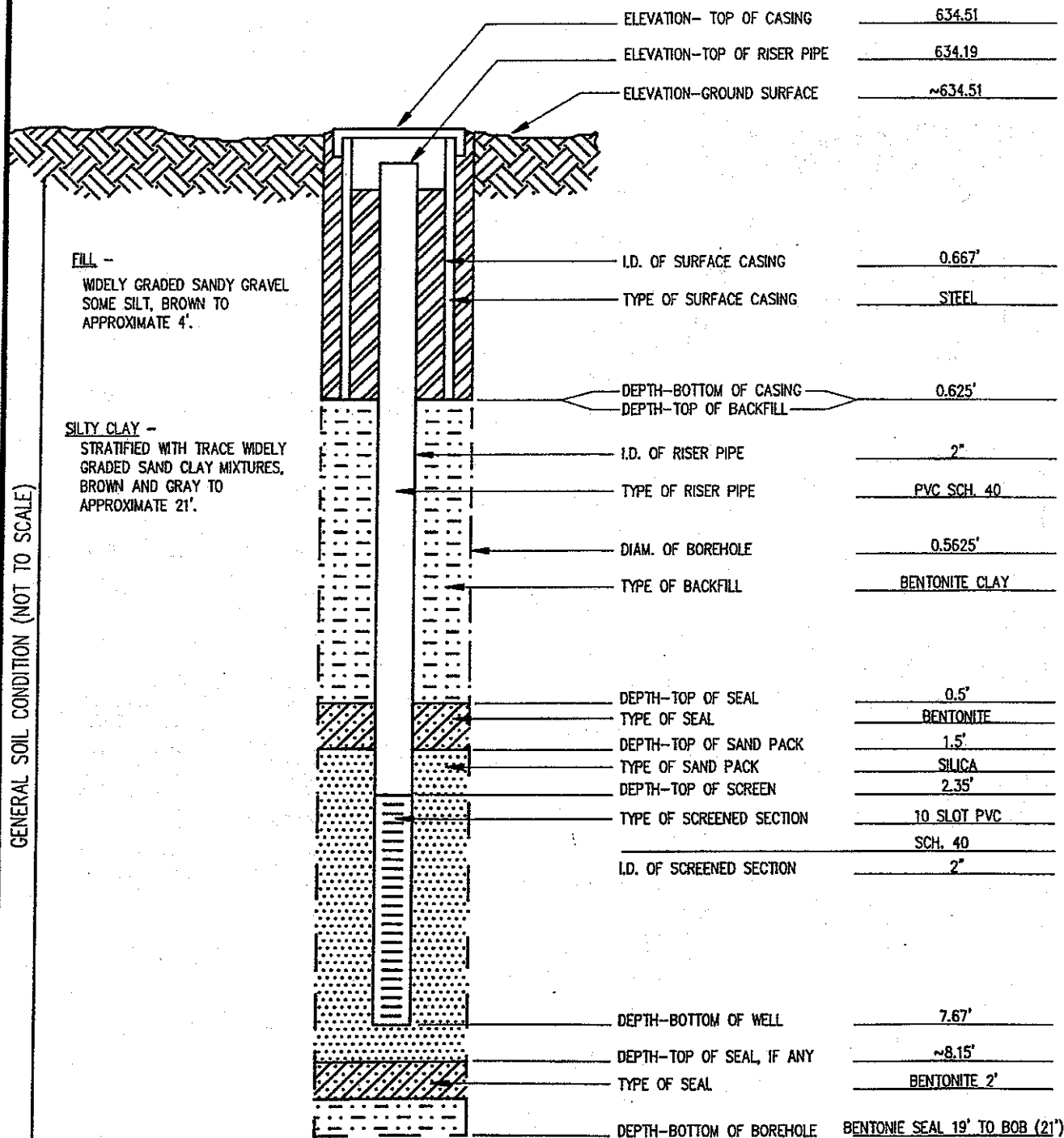
MCA-3

PG. 1 OF 1

BORING NO. B-5

LOCATION SEE SITE

PLAN \_\_\_\_\_





# MABBETT, CAPACCIO & ASSOCIATES, INC.

CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-8050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERG HEAT TREATING CO. PROJ. NO. 87024.D3

LOCATION 1975 N. RUBY ST. MELROSE PARK, IL

CONTRACTOR D & G DRILLING

DRILLER B. THOMASSON

LOGGED BY GLO

DATE 07/11/90

CHECKED BY \_\_\_\_\_

DATE \_\_\_\_\_

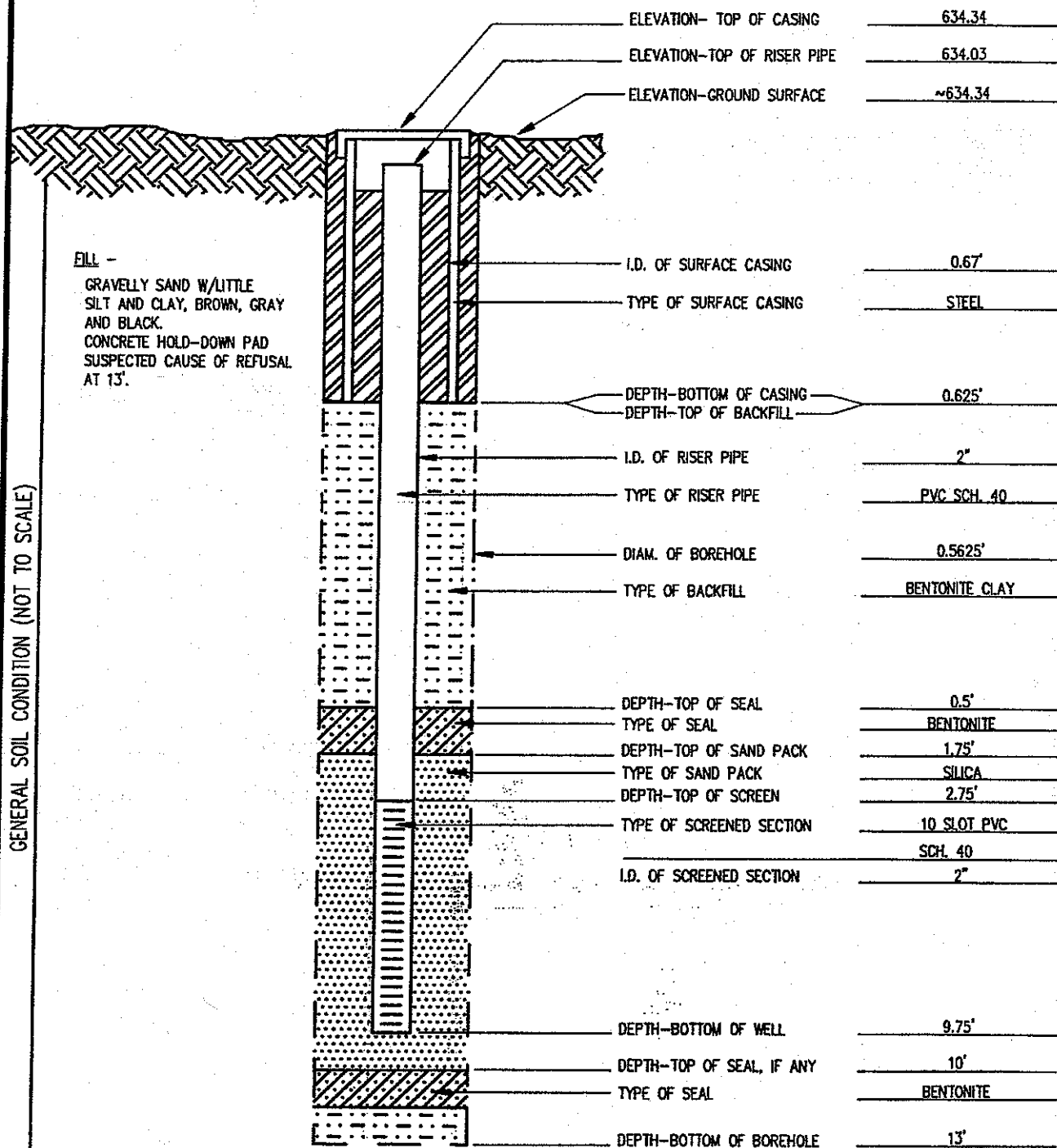
MCA-4

PG. 1 OF 1

BORING NO. B-6

LOCATION SEE SITE

PLAN





# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle • Bedford, Massachusetts 01730 • (617) 275-8050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERG HEAT TREATING CO. PROJ. NO. 87024.03

LOCATION 1975 N. RUBY ST. MELROSE PARK, IL.

CONTRACTOR D. & G. DRILLING DRILLER B. THOMASSON

LOGGED BY GLO DATE 07/13/90

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

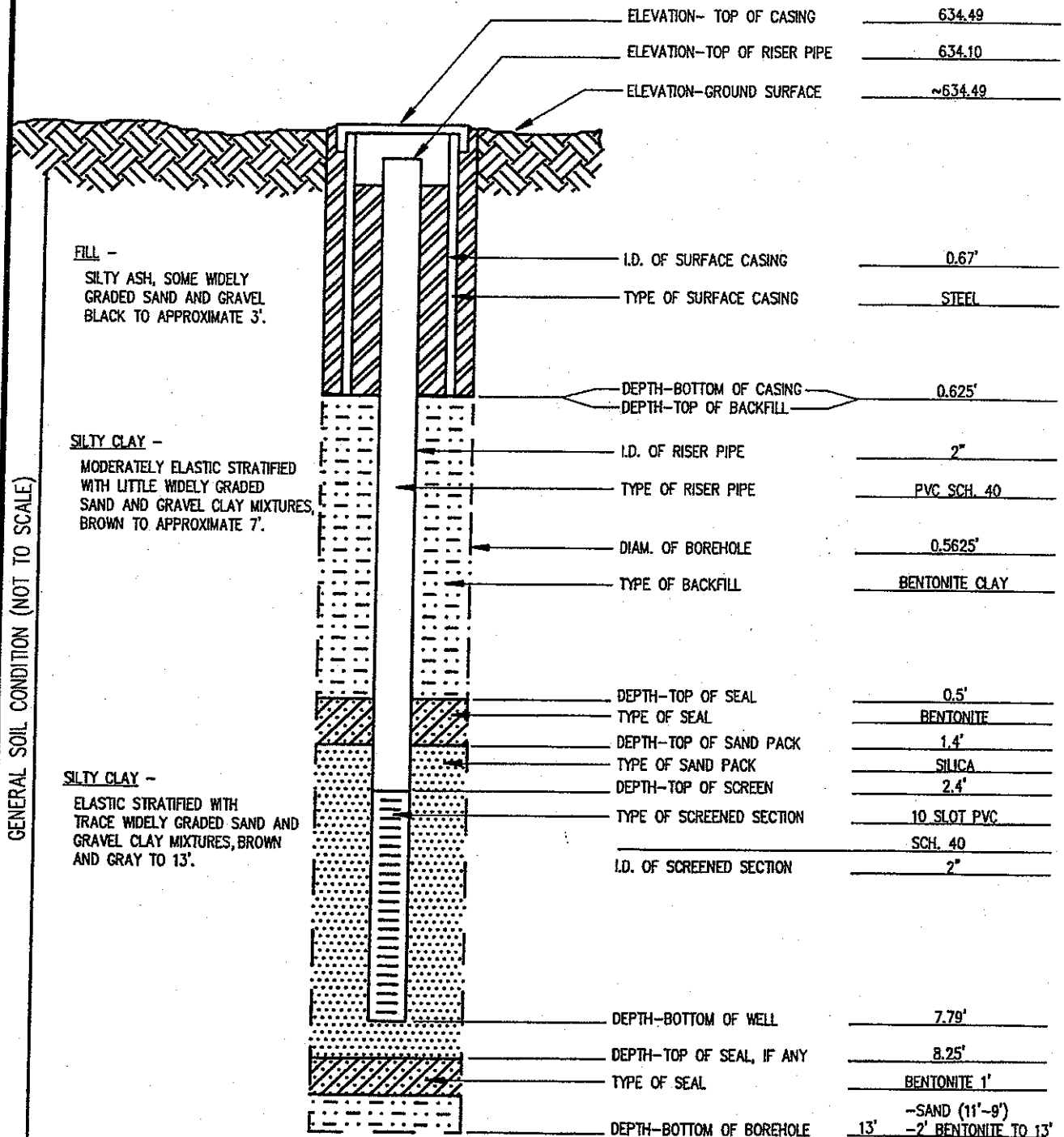
MCA-5

PG. 1 OF 1

BORING NO. B-7

LOCATION SEE SITE

PLAN



**APPENDIX B**  
**LABORATORY REPORTS**



MF/2  
DO NOT REMOVE

Project No. 87024.03

ALPHA ANALYTICAL LABORATORIES

Project Name LHT-Melrose

Eight Walkup Drive  
Westborough, Massachusetts 01581-6019  
(508) 898-9220

DF: GLS

MA 086 NH 198958-A CT PH-0574

CERTIFICATE OF ANALYSIS

Client: Mabbett, Capaccio & Associates

Laboratory Job Number: 903632

Address: 5 Alfred Circle

Invoice Number: 15051

Bedford, MA 01730

Date Received: 07/16/90

Attn: George Olson

Date Reported: 07/30/90

Client Designation: Project# 87024.03

Delivery Method: Federal Express

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
903632.1	B1-SS1	Melrose Park, IL
903632.1S	B1-SS1	Melrose Park, IL
903632.4	B1-SS4	Melrose Park, IL
903632.4D	B1-SS4	Melrose Park, IL
903632.10	B2-SS2	Melrose Park, IL
903632.13	B2-SS5	Melrose Park, IL
903632.14	B3-SS1	Melrose Park, IL
903632.18	B3-SS5	Melrose Park, IL
903632.19	B4-SS1	Melrose Park, IL
903632.23	B4-SS5	Melrose Park, IL
903632.23S	B4-SS5	Melrose Park, IL
903632.24	B5-SS1	Melrose Park, IL
903632.24D	B5-SS1	Melrose Park, IL
903632.27	B5-SS4	Melrose Park, IL
903632.30	B6-SS2	Melrose Park, IL
903632.33	B6-SS5	Melrose Park, IL
903632.34	B7-SS1	Melrose Park, IL
903632.36	B7-SS3	Melrose Park, IL
903632.38	B7-SS5	Melrose Park, IL

Authorized by: James R. Roth  
James R. Roth - Laboratory Manager

cp

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 903632.1 Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis) Date Reported: 07/30/90

Condition of Samples: Satisfactory Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***	ND	ug/Kg	**	1	8260	07/17/90	07/26/90
Total Hydrocarbons	ND	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	78.9	%	0.1	2	209A	----	07/17/90

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	91%
Toluene-d8	106%
4-Bromofluorobenzene	100%

COMMENTS: \* Complete list of References found in Addendum I

\*\* A list of volatile organics analyzed for and their detection limits accompanies this report.

\*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.1S      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RECOVERY
Total Hydrocarbons	95%

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COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 903632.4 Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis) Date Reported: 07/30/90

Condition of Samples: Satisfactory Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	ND	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	85.6	%	0.1	2	209A	----	07/17/90

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COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.4D                      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)                      Date Reported: 07/30/90

Condition of Samples: Satisfactory                      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	SAMPLE RESULT	REPLICATE RESULT	ZRPD
Total Hydrocarbons	ND	ND	NC

NC = Non calculable RPD

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.10      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***							
Trichloroethylene	100	ug/Kg	**	1	8260	07/17/90	07/26/90
Total Hydrocarbons	11,800	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	85.9	%	0.1	2	209A	----	07/17/90

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	110%
Toluene-d8	89%
4-Bromofluorobenzene	90%

COMMENTS: \* Complete list of References found in Addendum I

    \*\* A list of volatile organics analyzed for and their detection limits accompanies this report.

    \*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 903632.13 Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis) Date Reported: 07/30/90

Condition of Samples: Satisfactory Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	4,360	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	87.3	%	0.1	2	209A	----	07/17/90

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	110%
Toluene-d8	89%
4-Bromofluorobenzene	90%

COMMENTS: \* Complete list of References found in Addendum I

\*\* A list of volatile organics analyzed for and their detection limits accompanies this report.

\*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.14      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***							
Trichloroethylene	230	ug/Kg	**	1	8260	07/17/90	07/26/90
Total Hydrocarbons	2,280	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	80.1	%	0.1	2	209A	----	07/17/90

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	92%
Toluene-d8	104%
4-Bromofluorobenzene	104%

COMMENTS: \* Complete list of References found in Addendum I  
\*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
\*\*\* All compounds were below the detection limits except those listed above.



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.14D      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	SAMPLE RESULT	REPLICATE RESULT	ZRPD
Volatile Organics *** Trichloroethylene	230	220	4.4

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	91%
Toluene-d8	96%
4-Bromofluorobenzene	105%

COMMENTS: \* Complete list of References found in Addendum I  
\*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
\*\*\* All compounds were below the detection limits except those listed above.

**ALPHA ANALYTICAL LABORATORIES**  
**CERTIFICATE OF ANALYSIS**

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.18      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	733	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	86.3	%	0.1	2	209A	----	07/17/90

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COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.19      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	65,300	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	90.6	%	0.1	2	209A	----	07/17/90

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 903632.23 Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis) Date Reported: 07/30/90

Condition of Samples: Satisfactory Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	3,060	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	84.0	%	0.1	2	209A	----	07/17/90

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COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.238      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RECOVERY
Total Hydrocarbons	99%

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.24                      Date Received: 07/16/90

Sample Matrix: Solid (results were reported                      Date Reported: 07/30/90  
on a dry weight basis)

Condition of Samples: Satisfactory                      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	SAMPLE RESULT	REPLICATE RESULT	ZRPD
Total Hydrocarbons	ND	ND	NC

NC - Non calculable RPD

---

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.24      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***	ND	ug/Kg	**	1	8260	07/17/90	07/26/90
Total Hydrocarbons	ND	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	80.8	%	0.1	2	209A	----	07/17/90

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	93%
Toluene-d8	95%
4-Bromofluorobenzene	110%

COMMENTS:    \* Complete list of References found in Addendum I  
              \*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
              \*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.27      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	ND	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	85.1	%	0.1	2	209A	----	07/17/90

COMMENTS: \* Complete list of References found in Addendum I



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.30      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	1,280	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	83.1	%	0.1	2	209A	----	07/17/90

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.33      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	EXT/PREP	DATES ANALYSIS
Total Hydrocarbons	4,180	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	83.5	%	0.1	2	209A	----	07/17/90

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.34                      Date Received: 07/16/90

Sample Matrix: Solid (results were reported    Date Reported: 07/30/90  
on a dry weight basis)

Condition of Samples: Satisfactory                      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Hydrocarbons	ND	mg/Kg	40	2	503BCE	07/16/90	07/17/90
Total Solids	86.3	%	0.1	2	209A	----	07/17/90

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 903632.36      Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis)      Date Reported: 07/30/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***							
Trichloroethylene	45,000	ug/Kg	**	1	8260	07/17/90	07/27/90
Trans-1,2-dichloro-ethylene	8,600	ug/Kg	**	1	8260	07/17/90	07/27/90
Total Solids	83.4	%	0.1	2	209A	----	07/27/90

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	89%
Toluene-d8	98%
4-Bromofluorobenzene	95%

COMMENTS: \* Complete list of References found in Addendum I  
          \*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
          \*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABS  
VOLATILE ORGANICS ANALYSIS by GC/MS  
METHOD 8260

Alpha Job Number: 903632 Date Reported: 7/30/90  
Alpha Sample Number(s): 903632.1, .10, .14, .14D, .24, .36 & .38  
Method Detection Limit: See Below

---

COMPOUNDS  
-----

Methylene chloride	140 ug/Kg
1,1-Dichloroethane	235 ug/Kg
Chloroform	80 ug/Kg
Carbon tetrachloride	140 ug/Kg
1,2-Dichloropropane	300 ug/Kg
Dibromochloromethane	155 ug/Kg
1,1,2-Trichloroethane	250 ug/Kg
2-Chloroethylvinyl ether	500 ug/Kg
Tetrachloroethene	205 ug/Kg
Chlorobenzene	300 ug/Kg
Trichlorofluoromethane	250 ug/Kg
1,2-Dichloroethane	140 ug/Kg
1,1,1-Trichloroethane	190 ug/Kg
Bromodichloromethane	110 ug/Kg
trans-1,3-Dichloropropene	250 ug/Kg
cis-1,3-Dichloropropene	250 ug/Kg
Bromoform	235 ug/Kg
1,1,2,2-Tetrachloroethane	345 ug/Kg
Benzene	300 ug/Kg
Toluene	300 ug/Kg
Ethyl benzene	360 ug/Kg
Xylenes	500 ug/Kg
Chloromethane	400 ug/Kg
Bromomethane	350 ug/Kg
Vinyl chloride	325 ug/Kg
Chloroethane	375 ug/Kg
1,1-Dichloroethene	140 ug/Kg
Trans-1,2-dichloroethene	80 ug/Kg
Cis-1,2-dichloroethene	80 ug/Kg
Trichloroethene	95 ug/Kg
Dibromomethane	235 ug/Kg
1,4-Dichloro-2-butane	500 ug/Kg
Ethanol	5,000 ug/Kg
Iodomethane	325 ug/Kg
1,2,3-Trichloropropane	300 ug/kg
Styrene	500 ug/Kg
Dichlorodifluoromethane	5,000 ug/Kg
Acetone	5,000 ug/Kg
Carbon disulfide	1,000 ug/Kg
2-Butanone	1,500 ug/Kg
Vinyl acetate	1,500 ug/Kg
4-Methyl-2-pentanone	1,000 ug/Kg
2-Hexanone	1,000 ug/Kg

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ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 903632.38 Date Received: 07/16/90

Sample Matrix: Solid (results were reported on a dry weight basis) Date Reported: 07/30/90

Condition of Samples: Satisfactory Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Analysis as Listed Below

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***							
Trichloroethylene	180,000	ug/Kg	**	1	8260	07/17/90	07/27/90
Trans-1,2-dichloro-ethylene	1,300	ug/Kg	**	1	8260	07/17/90	07/27/90
Total Solids	84.5	%	0.1	2	209A	----	07/27/90

Volatile Organics	%Surrogate Recovery
1,2-Dichloroethane-d4	101%
Toluene-d8	106%
4-Bromofluorobenzene	106%

COMMENTS: \* Complete list of References found in Addendum I  
\*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
\*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
ACCEPTABLE SURROGATE SPIKE RECOVERY LIMITS

FRACTION	SURROGATE COMPOUND	LOW/MEDIUM WATER	LOW/MEDIUM SOIL/SEDIMENT
VOA	Toluene-d <sub>8</sub>	88-110 %	81-117 %
VOA	4-Bromofluorobenzene	86-115 %	74-121 %
VOA	1,2-Dichloroethane-d <sub>4</sub>	76-114 %	70-121 %
BNA	Nitrobenzene-d <sub>5</sub>	35-114 %	23-120 %
BNA	2-Fluorobiphenyl	43-116 %	30-115 %
BNA	p-Terphenyl-d <sub>14</sub>	33-141 %	18-137 %
BNA	Phenol-d <sub>5</sub>	10-94 %	24-113 %
BNA	2-Fluorophenol	21-100 %	25-121 %
BNA	2,4,6-Tribromophenol	10-123 %	19-122 %
Pest.	Dibutylchloroendate	24-154 %	20-150 %

## ALPHA ANALYTICAL LABORATORIES

## ACCEPTABLE MATRIX SPIKE RECOVERY LIMITS

## FOR ORGANICS

FRACTION	MATRIX SPIKE COMPOUND	WATER	SOIL/SEDIMENT
VOA	1,1-Dichloroethene	61-145 %	59-172 %
VOA	Trichloroethene	71-120 %	62-137 %
VOA	Chlorobenzene	75-130 %	60-133 %
VOA	Toluene	76-125 %	59-139 %
VOA	Benzene	76-127 %	66-142 %
BN	1,2,4-Trichlorobenzene	39-98 %	38-107 %
BN	Acenaphthene	46-118 %	31-137 %
BN	2,4-Dinitrotoluene	24-96 %	28-89 %
BN	Di-n-butyl phthalate	11-117 %	29-135 %
BN	Pyrene	26-127 %	35-142 %
BN	N-nitros-di-n-propylamine	41-116 %	41-126 %
BN	1,4-Dichlorobenzene	36-97 %	28-104 %
Acid	Pentachlorophenol	9-103 %	17-109 %
Acid	Phenol	12-89 %	26-90 %
Acid	2-Chlorophenol	27-123 %	25-102 %
Acid	4-Chloro-3-methylphenol	23-97 %	26-103 %
Acid	4-Nitrophenol	10-80 %	11-114 %
Pest.	Lindane	56-123 %	46-127 %
Pest.	Heptachlor	40-131 %	35-130 %
Pest.	Aldrin	40-120 %	34-132 %
Pest.	Dieldrin	52-126 %	31-134 %
Pest.	Endrin	56-121 %	42-139 %
Pest.	4,4'-DDT	38-127 %	23-134 %



ALPHA ANALYTICAL LABORATORIES

RELATIVE PERCENT DIFFERENCE

CRITERIA FOR DUPLICATE ANALYSIS

PARAMETER GROUP	WATER	SOIL
Organics:		
Volatile Organics	30 %	30 %
Acid/Base/Neutrals	40 %	40 %
Pesticides/PCB's	40 %	40 %
Inorganics:		
Metals	20 %	30 %
Wet Chemistry	30 %	30 %

ALPHA ANALYTICAL LABS  
ADDENDUM I  
REFERENCES

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1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1986.
  2. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WPCF. 16th Edition. 1985.
  3. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WPCF. 17th Edition. 1989.
  4. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-82-055. 1983.
  5. Oil Spill Identification System. CG-D-52-77 U. S. Coast Guard. 1977.
  6. Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water. EPA 600/4-82-057. 1982.
  7. U. S. Department of Health, Education, and Welfare, National Institute of Occupational Safety and Health. D. G. Taylor, [Manual of Analytical Methods, 2nd Ed., DHEW (NIOSH) Pub. No. 77-237A, 1977.]
  8. Handbook of Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. March 1979.
  9. The United States Pharmacopeia. The National Formulary. USP 20th Edition. Formulary 15th Edition. 1980.
  10. Choosing Cost-Effective QA/QC (Quality Assurance/Quality Control) Programs for Chemical Analysis. PB85-241461. U. S. Department of Commerce, National Technical Information Service. August 1985.
  11. Manual of Analytical Quality Control for Pesticides in Human and Environmental Media. PB 261 019. EPA 600/1-76-017. February 1975.
  12. Annual Book of ASTM Standards. Sections 0, 3, 5, 6, 8, 9, 11, and 14. American Society for Testing and Materials 1986.
  13. Federal Register, part II. 40 CFR, part 261, et al, pp. 11798-11877. March 29, 1990.
  14. Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. Available from USEPA, Cincinnati, 26 West Martin Luther King Drive, Cincinnati, Ohio, 45268.
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ALPHA ANALYTICAL LABS  
ADDENDUM I  
REFERENCES

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15. Interim Methods for the Determination of Asbestiform Minerals in Bulk Insulation Samples, Research Triangle Institute, June 1980. Asbestos Containing Materials in School Buildings: A Guidance Document, March 1979, USEPA Document C00090, parts 1 & 2.
16. Interim Methods for the Determination of Asbestos in Bulk Insulation Samples (EPA-600/M4-82-020).
17. "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," Publication EPA-600/4-80-032, U. S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, August 1980.
18. "Clean Harbors Radiological Environmental Analytical Procedures," Clean Harbors Analytical Services, Braintree, MA, October 1985.
19. H. M. Prichard and T. F. Gesell, "Rapid Measurement of RN-222 Concentrations in Water with a Commercial Liquid Scintillation Counter", Health Physics, Volume 33, 1977, pp. 577-581.
20. "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", March 1979, EPA 600/4-79-019.
21. Analysis of PCB's in Transformer Fluid and Waste Oil. EPA 600/4-81-045. 1981.
22. Klute, A. 1986, "Methods of Soil Analysis, Part 1", Methods 15-2.2 and 15-5.1. American Society of Agronomy, Madison, WI.
23. Exhibit No. 1. Petroleum Oils by Gas Chromatography. Alley Young & Baumgartner, Inc., Consulting Engineers, PO Box 2036, Brentwood, TN 37024.

<b>MCA</b> MABBETT CAPACCIO INC & ASSOCIATES, INC.	CHAIN OF CUSTODY RECORD	PROJECT NO.	PROJ. NAME
	Nº 00480	87024.03	

SITE NAME:		SITE LOCATION:		CONTAINER TYPE		HOLD FOR SELECTION ON 7/16/90 BY REMARKS GEORGE OLSON } MCA OR LEON LATAILLER	
SAMPLER (SIGNATURE):		MELROSE PARK, IL		NO. OF CONTAINERS 1 TPH (GROSS) 1240			
SAMPLE NO. DATE TIME COMP GRAB SAMPLE LOCATION							
8	7/9/90	11:50	✓		B-1 SS-1	1	
7-9	12:05	✓			B-1 SS-2	1	
7-9	12:15	✓			B-1 SS-3	1	
7-9	12:35	✓			B-1 SS-4	1	
7-9	13:00	✓			B-1 SS-5	1	
7-9	13:35	✓			B-1 SS-6	1	
7-9	14:25	✓			B-1 SS-7	1	
7-9	15:00	✓			B-1 SS-8	1	
7-93	8:20	✓			B-2 SS-1	1	
7-93	8:35	✓			B-2 SS-2	1	
7-93	8:45	✓			B-2 SS-3	1	
7-13	8:55	✓			B-2 SS-4	1	
7-13	9:05	✓			B-2 SS-5	1	
7-10	15:40	✓			B-3 SS-1	1	
7-10	15:55	✓			B-3 SS-2	1	
7-10	16:20	✓			B-3 SS-3	1	
7-10	16:40	✓			B-3 SS-4	1	
7-10	17:05	✓			B-3 SS-5	1	
7-11	11:00	✓			B-4 SS-1	1	
7-11	11:10	✓			B-4 SS-2	1	
7-11	11:25	✓			B-4 SS-3	1	
7-11	11:40	✓			B-4 SS-4	1	
7-11	11:55	✓			B-4 SS-5	1	
7-11	11:55	✓			B-5 SS-1	1	
RELINQUISHED BY (SIGNATURE):		DATE/TIME:		RECEIVED BY (SIGNATURE):		DATE/TIME:	
George Olson		7/13/90 9:00		FEDERAL EXPRESS			
RELINQUISHED BY (SIGNATURE):		DATE/TIME:		RECEIVED BY (SIGNATURE):		DATE/TIME:	
RELINQUISHED BY (SIGNATURE):		DATE/TIME:		LABORATORY		RECEIVED BY (SIGNATURE):	
						DATE/TIME:	

Distribution: Original accompanies shipment; copy to master file

2 week TPH

**MCA** MABBETT  
CAPACCIO  
INC & ASSOCIATES, INC.

CHAIN OF CUSTODY  
RECORD

Nº 00481

PROJECT NO.

87024.03

PROJ. NAME

SITE NAME:					SITE LOCATION: MELROSE PARK, IL					NO. OF CON- TAINERS	CONTAINER TYPE TEFLON LIDDED GLASS						REMARKS HOLD FOR SECTION ON 7/16/90 BY GEORGE OLSON } MCA OR LEON LAMALLE }
SAMPLER (SIGNATURE): George Olson																	
SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION												
	7-12-90	11:05	✓		B-5 SS-2					1							
	7-12	11:20	✓		B-5 SS-3					1							
	7-12	11:35	✓		<del>B-5 SS-4</del>					1	X						
	7-12	11:50	✓		B-5 SS-5					1							
	7-12	12:30	✓		B-5 SS-6					1							
	7-12	12:35	✓		<del>B-6 SS-2</del>					1	X						
	7-12	14:40	✓		B-6 SS-3					1							
	7-12	14:55	✓		B-6 SS-4					1							
	7-12	15:05	✓		<del>B-6 SS-5</del>					1	X						
	7-13	15:05	✓		<del>B-7 SS-1</del>					1	X						
	7-13	15:10	✓		B-7 SS-2					1							
	7-13	15:15	✓		<del>B-7 SS-3</del>					1	X						
	7-13		✓		B-7 SS-4					1							
	7-13		✓		<del>B-7 SS-5</del>					1	X						

RELINQUISHED BY (SIGNATURE): George Olson	DATE/TIME: 17:00 7/13/90	RECEIVED BY (SIGNATURE): FED EXPRESS	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	LABORATORY	RECEIVED BY (SIGNATURE):	DATE/TIME:	

Distribution: Original accompanies shipment; copy to master file

## ALPHA ANALYTICAL LABORATORIES

MF 12

DO NOT REMOVE

Eight Walkup Drive  
Westborough, Massachusetts  
(508) 898-9220

Project No. 87024.03

Project Name Lindburg

MA 086 NH 198958-A CT

DF: 0574  
PH: 0574  
CC:

## CERTIFICATE OF ANALYSIS

Client: Mabbett, Capaccio &amp; Associates

Laboratory Job Number: 904735

Address: 5 Alfred Circle  
Bedford, MA 01730

Invoice Number: 16201

Date Received: 09/07/90

Attn: George Olson

Date Reported: 09/21/90

Client Designation: Project #87024.03

Delivery Method: Federal Express

ALPHA SAMPLE NUMBER	CLIENT IDENTIFICATION	SAMPLE LOCATION
904735.1	MW-1	Melrose Park, IL
904735.2	MW-2	Melrose Park, IL
904735.2D	MW-2 (Duplicate)	Melrose Park, IL
904735.3	MW-3	Melrose Park, IL
904735.3S	MW-3 (Spike Recovery)	Melrose Park, IL
904735.4	MW-4	Melrose Park, IL
904735.5	MW-5	Melrose Park, IL
904735.6	Tripblank	Melrose Park, IL

Authorized by:

Scott McLean - Laboratory Director

kmg

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 904735.1      Date Received: 09/07/90  
Sample Matrix: Liquid      Date Reported: 09/21/90  
Condition of Samples: Satisfactory      Field Prep: None  
Number & Type of Containers: One glass bottle and two VOA vials  
Analysis Requested: Total Petroleum Hydrocarbons (IR) and Volatile Organics

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Petroleum Hydrocarbons	ND	mg/L	0.5	2	503BE	09/10/90	09/11/90
Volatile Organics ***							
Trichloroethylene	2.1	ug/L	**	1	8260	----	09/20/90
Cis-1,2-dichloroethylene	88	ug/L	**	1	8260	----	09/20/90
Trans-1,2-dichloroethylene	3.0	ug/L	**	1	8260	----	09/20/90

Volatile Organics    % Surrogate Recovery

1,2-Dichloroethane-d4	94%
Toluene-d8	96%
4-Bromofluorobenzene	91%

COMMENTS: \* Complete list of References found in Addendum I  
\*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
\*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 904735.2      Date Received: 09/07/90  
Sample Matrix: Liquid      Date Reported: 09/21/90  
Condition of Samples: Satisfactory      Field Prep: None  
Number & Type of Containers: One glass bottle and two VOA vials  
Analysis Requested: Total Petroleum Hydrocarbons (IR) and Volatile Organics

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Petroleum Hydrocarbons	3,346	mg/L	0.5	2	503BE	09/10/90	09/11/90
Volatile Organics ***							
Trichloroethylene	11	ug/L	**	1	8260	----	09/21/90
1,1,1-Trichloroethane	38	ug/L	**	1	8260	----	09/21/90

Volatile Organics    % Surrogate Recovery

1,2-Dichloroethane-d4	100%
Toluene-d8	85%
4-Bromofluorobenzene	85%

COMMENTS: \* Complete list of References found in Addendum I  
\*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
\*\*\* All compounds were below the detection limits except those listed above.



ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 904735.2D

Date Received: 09/07/90

Sample Matrix: Liquid

Date Reported: 09/21/90

Condition of Samples: Satisfactory

Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Total Petroleum Hydrocarbons (IR)

PARAMETER	SAMPLE RESULT	DUPLICATE RESULT	ZRPD
Total Petroleum Hydrocarbons	3,346	3,270	2%

COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 904735.3                      Date Received: 09/07/90

Sample Matrix: Liquid                                      Date Reported: 09/21/90

Condition of Samples: Satisfactory                      Field Prep: None

Number & Type of Containers: One glass bottle and two VOA vials

Analysis Requested: Total Petroleum Hydrocarbons (IR) and Volatile Organics

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Petroleum Hydrocarbons	ND	mg/L	0.5	2	503BE	09/10/90	09/11/90
Volatile Organics ***							
Cis-1,2-dichloroethylene	19	ug/L	**	1	8260	----	09/20/90

Volatile Organics    % Surrogate Recovery

1,2-Dichloroethane-d4	105%
Toluene-d8	95%
4-Bromofluorobenzene	93%

COMMENTS:    \* Complete list of References found in Addendum I  
              \*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
              \*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086 NH 198958-A CT PH-0574

Laboratory Sample Number: 904735.3S

Date Received: 09/07/90

Sample Matrix: Liquid

Date Reported: 09/21/90

Condition of Samples: Satisfactory

Field Prep: None

Number & Type of Containers: One glass bottle

Analysis Requested: Total Petroleum Hydrocarbons (IR)

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PARAMETER

%RECOVERY

---

Total Petroleum  
Hydrocarbons

90%

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COMMENTS: \* Complete list of References found in Addendum I

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 904735.4      Date Received: 09/07/90

Sample Matrix: Liquid      Date Reported: 09/21/90

Condition of Samples: Satisfactory      Field Prep: None

Number & Type of Containers: One glass bottle and two VOA vials

Analysis Requested: Total Petroleum Hydrocarbons (IR) and Volatile Organics

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Total Petroleum Hydrocarbons	13	mg/L	0.5	2	503BE	09/10/90	09/11/90
Volatile Organics ***	ND	ug/L	**	1	8260	----	09/21/90

Volatile Organics    % Surrogate Recovery

1,2-Dichloroethane-d4	102%
Toluene-d8	83%
4-Bromofluorobenzene	115%

COMMENTS:    \* Complete list of References found in Addendum I  
              \*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
              \*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 904735.5      Date Received: 09/07/90  
Sample Matrix: Liquid      Date Reported: 09/21/90  
Condition of Samples: Satisfactory      Field Prep: None  
Number & Type of Containers: Two VOA vials  
Analysis Requested: Volatile Organics

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***							
1,1-Dichloroethane	6.0	ug/L	**	1	8260	----	09/20/90
Trichloroethylene	41,000	ug/L	**	1	8260	----	09/20/90
Tetrachloroethylene	120	ug/L	**	1	8260	----	09/20/90
Cis-1,2-dichloroethylene	27,000	ug/L	**	1	8260	----	09/20/90
Trans-1,2-dichloroethylene	2,100	ug/L	**	1	8260	----	09/20/90
1,2-Dichloroethane	3.6	ug/L	**	1	8260	----	09/20/90
Toluene	22	ug/L	**	1	8260	----	09/20/90
Vinyl chloride	6,600	ug/L	**	1	8260	----	09/20/90

Volatile Organics    % Surrogate Recovery

1,2-Dichloroethane-d4	106%
Toluene-d8	114%
4-Bromofluorobenzene	88%

COMMENTS:    \* Complete list of References found in Addendum I  
              \*\* A list of volatile organics analyzed for and their detection limits accompanies this report.  
              \*\*\* All compounds were below the detection limits except those listed above.

ALPHA ANALYTICAL LABORATORIES  
CERTIFICATE OF ANALYSIS

MA 086    NH 198958-A    CT PH-0574

Laboratory Sample Number: 904735.6      Date Received: 09/07/90  
Sample Matrix: Water      Date Reported: 09/21/90  
Condition of Samples: Satisfactory      Field Prep: None  
Number & Type of Containers: One VOA vial  
Analysis Requested: Volatile Organics

PARAMETER	RESULT	UNITS	MDL**	REF*	METHOD	DATES	
						EXT/PREP	ANALYSIS
Volatile Organics ***	ND	ug/L	**	1	8260	----	09/19/90

Volatile Organics    % Surrogate Recovery

1,2-Dichloroethane-d4	100%
Toluene-d8	87%
4-Bromofluorobenzene	117%

COMMENTS:    \* Complete list of References found in Addendum I  
              \*\* A list of volatile organics analyzed for and their detection  
                  limits accompanies this report.  
              \*\*\* All compounds were below the detection limits except those  
                  listed above.

ALPHA ANALYTICAL LABS  
VOLATILE ORGANICS ANALYSIS by GC/MS  
METHOD 8260

Alpha Job Number: 904735

Date Reported: 09/21/90

Alpha Sample Number(s): 904735.1, .3, .5, .6

Method Detection Limit: See below

COMPOUNDS

Methylene chloride	2.8 ug/L
1,1-Dichloroethane	4.7 ug/L
Chloroform	1.6 ug/L
Carbon tetrachloride	2.8 ug/L
1,2-Dichloropropane	6.0 ug/L
Dibromochloromethane	3.1 ug/L
1,1,2-Trichloroethane	5.0 ug/L
2-Chloroethylvinyl ether	10.0 ug/L
Tetrachloroethene	4.1 ug/L
Chlorobenzene	6.0 ug/L
Trichlorofluoromethane	5.0 ug/L
1,2-Dichloroethane	2.8 ug/L
1,1,1-Trichloroethane	3.8 ug/L
Bromodichloromethane	2.2 ug/L
Trans-1,3-Dichloropropene	5.0 ug/L
Cis-1,3-Dichloropropene	5.0 ug/L
Bromoform	4.7 ug/L
1,1,2,2-Tetrachloroethane	6.9 ug/L
Benzene	6.0 ug/L
Toluene	6.0 ug/L
Ethyl benzene	7.2 ug/L
Xylenes	10.0 ug/L
Chloromethane	8.0 ug/L
Bromomethane	7.0 ug/L
Vinyl chloride	6.5 ug/L
Chloroethane	7.5 ug/L
1,1-Dichloroethene	2.8 ug/L
Trans-1,2-dichloroethene	1.6 ug/L
Cis-1,2-dichloroethene	1.6 ug/L
Trichloroethene	1.9 ug/L
Dibromomethane	4.7 ug/L
1,4-Dichloro-2-butane	100.0 ug/L
Ethanol	100.0 ug/L
Iodomethane	7.0 ug/L
1,2,3-Trichloropropane	6.0 ug/L
Dichlorodifluoromethane	100.0 ug/L
Acetone	100.0 ug/L
Carbon disulfide	20.0 ug/L
2-Butanone	30.0 ug/L
Vinyl acetate	30.0 ug/L
4-Methyl-2-pentanone	20.0 ug/L
2-Hexanone	20.0 ug/L
Styrene	10.0 ug/L

ALPHA ANALYTICAL LABS  
VOLATILE ORGANICS ANALYSIS by GC/MS  
METHOD 8260

Alpha Job Number: 904735

Date Reported: 09/21/90

Alpha Sample Number(s): 904735.2 & .4

Method Detection Limit: 5 times greater than listed below

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COMPOUNDS

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Methylene chloride	2.8 ug/L
1,1-Dichloroethane	4.7 ug/L
Chloroform	1.6 ug/L
Carbon tetrachloride	2.8 ug/L
1,2-Dichloropropane	6.0 ug/L
Dibromochloromethane	3.1 ug/L
1,1,2-Trichloroethane	5.0 ug/L
2-Chloroethylvinyl ether	10.0 ug/L
Tetrachloroethene	4.1 ug/L
Chlorobenzene	6.0 ug/L
Trichlorofluoromethane	5.0 ug/L
1,2-Dichloroethane	2.8 ug/L
1,1,1-Trichloroethane	3.8 ug/L
Bromodichloromethane	2.2 ug/L
Trans-1,3-Dichloropropene	5.0 ug/L
Cis-1,3-Dichloropropene	5.0 ug/L
Bromoform	4.7 ug/L
1,1,2,2-Tetrachloroethane	6.9 ug/L
Benzene	6.0 ug/L
Toluene	6.0 ug/L
Ethyl benzene	7.2 ug/L
Xylenes	10.0 ug/L
Chloromethane	8.0 ug/L
Bromomethane	7.0 ug/L
Vinyl chloride	6.5 ug/L
Chloroethane	7.5 ug/L
1,1-Dichloroethene	2.8 ug/L
Trans-1,2-dichloroethene	1.6 ug/L
Cis-1,2-dichloroethene	1.6 ug/L
Trichloroethene	1.9 ug/L
Dibromomethane	4.7 ug/L
1,4-Dichloro-2-butane	100.0 ug/L
Ethanol	100.0 ug/L
Iodomethane	7.0 ug/L
1,2,3-Trichloropropane	6.0 ug/L
Dichlorodifluoromethane	100.0 ug/L
Acetone	100.0 ug/L
Carbon disulfide	20.0 ug/L
2-Butanone	30.0 ug/L
Vinyl acetate	30.0 ug/L
4-Methyl-2-pentanone	20.0 ug/L
2-Hexanone	20.0 ug/L
Styrene	10.0 ug/L

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# ALPHA ANALYTICAL LABORATORIES

## ACCEPTABLE SURROGATE SPIKE RECOVERY LIMITS

FRACTION	SURROGATE COMPOUND	LOW/MEDIUM WATER	LOW/MEDIUM SOIL/SEDIMENT
VOA	Toluene-d <sub>8</sub>	88-110 %	81-117 %
VOA	4-Bromofluorobenzene	86-115 %	74-121 %
VOA	1,2-Dichloroethane-d <sub>4</sub>	76-114 %	70-121 %
BNA	Nitrobenzene-d <sub>5</sub>	35-114 %	23-120 %
BNA	2-Fluorobiphenyl	43-116 %	30-115 %
BNA	p-Terphenyl-d <sub>14</sub>	33-141 %	18-137 %
BNA	Phenol-d <sub>5</sub>	10-94 %	24-113 %
BNA	2-Fluorophenol	21-100 %	25-121 %
BNA	2,4,6-Tribromophenol	10-123 %	19-122 %
Pest.	Dibutylchloroendate	24-154 %	20-150 %

ALPHA ANALYTICAL LABORATORIES  
ACCEPTABLE MATRIX SPIKE RECOVERY LIMITS  
FOR INORGANICS

PARAMETER GROUP	WATER	SOIL
Metals	75-125 %	60-140 %
Wet Chemistry	70-130 %	N/A

ALPHA ANALYTICAL LABORATORIES  
RELATIVE PERCENT DIFFERENCE  
CRITERIA FOR DUPLICATE ANALYSIS

PARAMETER GROUP	WATER	SOIL
Organics:		
Volatile Organics	30 %	30 %
Acid/Base/Neutrals	40 %	40 %
Pesticides/PCB's	40 %	40 %
Inorganics:		
Metals	20 %	30 %
Wet Chemistry	30 %	30 %

ALPHA ANALYTICAL LABS  
ADDENDUM I  
REFERENCES

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1. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. 1986.
  2. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WPCF. 16th Edition. 1985.
  3. Standard Methods for Examination of Water and Waste Water. APHA-AWWA-WPCF. 17th Edition. 1989.
  4. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-82-055. 1983.
  5. Oil Spill Identification System. CG-D-52-77 U. S. Coast Guard. 1977.
  6. Methods for Organic Chemical Analysis of Municipal and Industrial Waste Water. EPA 600/4-82-057. 1982.
  7. U. S. Department of Health, Education, and Welfare, National Institute of Occupational Safety and Health. D. G. Taylor, [Manual of Analytical Methods, 2nd Ed., DHEW (NIOSH) Pub. No. 77-237A, 1977.]
  8. Handbook of Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. March 1979.
  9. The United States Pharmacopeia. The National Formulary. USP 20th Edition. Formulary 15th Edition. 1980.
  10. Choosing Cost-Effective QA/QC (Quality Assurance/Quality Control) Programs for Chemical Analysis. PB85-241461. U. S. Department of Commerce, National Technical Information Service. August 1985.
  11. Manual of Analytical Quality Control for Pesticides in Human and Environmental Media. PB 261 019. EPA 600/1-76-017. February 1975.
  12. Annual Book of ASTM Standards. Sections 0, 3, 5, 6, 8, 9, 11, and 14. American Society for Testing and Materials 1986.
  13. Federal Register, part II. 40 CFR, part 261, et al, pp. 11798-11877. March 29, 1990.
  14. Methods for the Determination of Organic Compounds in Finished Drinking Water and Raw Source Water. Available from USEPA, Cincinnati, 26 West Martin Luther King Drive, Cincinnati, Ohio, 45268.
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ALPHA ANALYTICAL LABS  
ADDENDUM I  
REFERENCES

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15. Interim Methods for the Determination of Asbestiform Minerals in Bulk Insulation Samples, Research Triangle Institute, June 1980. Asbestos Containing Materials in School Buildings: A Guidance Document, March 1979, USEPA Document C00090, parts 1 & 2.
16. Interim Methods for the Determination of Asbestos in Bulk Insulation Samples (EPA-600/M4-82-020).
17. "Prescribed Procedures for Measurement of Radioactivity in Drinking Water," Publication EPA-600/4-80-032, U. S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, August 1980.
18. "Clean Harbors Radiological Environmental Analytical Procedures," Clean Harbors Analytical Services, Braintree, MA, October 1985.
19. H. M. Prichard and T. F. Gesell, "Rapid Measurement of RN-222 Concentrations in Water with a Commercial Liquid Scintillation Counter", Health Physics, Volume 33, 1977, pp. 577-581.
20. "Handbook for Analytical Quality Control in Water and Wastewater Laboratories", March 1979, EPA 600/4-79-019.
21. Analysis of PCB's in Transformer Fluid and Waste Oil. EPA 600/4-81-045. 1981.
22. Klute, A. 1986, "Methods of Soil Analysis, Part 1", Methods 15-2.2 and 15-5.1. American Society of Agronomy, Madison, WI.
23. Exhibit No. 1. Petroleum Oils by Gas Chromatography. Alley Young & Baumgartner, Inc., Consulting Engineers, PO Box 2036, Brentwood, TN 37024.

MCA MABBETT CAPACCO INC & ASSOCIATES, INC.				CHAIN OF CUSTODY RECORD		PROJECT NO.		PROJ. NAME	
SITE NAME:				SITE LOCATION:		CONTAINER TYPE			
SAMPLER (SIGNATURE):				NO. OF CON-TAINERS		(2) 40 ml VOAs (1) 1 liter glass w/ teflon lid		REMARKS	
George Olson									
SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION				
	9/6/90	11:30	✓		MW-1	3	✓	✓	Two wk/10 day TAT
	9/6	16:05	✓		MW-2	3	✓	✓	
	9/6	12:05	✓		MW-3	3	✓	✓	(2) 40 ml VOAs for 684
	9/6	13:50	✓		MW-4	3	✓	✓	(1) 1 liter glass w/ teflon lid
	9/6	15:10	✓		MW-5	2	✓	✓	preserved w/ HCl - 4% 1 or 503
					Trip Blank	1	✓		
Written results due 9/21/90.									
RELINQUISHED BY (SIGNATURE):				DATE/TIME:		RECEIVED BY (SIGNATURE):		DATE/TIME:	
George Olson				9/6/90 17:00		Fed Ex			
RELINQUISHED BY (SIGNATURE):				DATE/TIME:		RECEIVED BY (SIGNATURE):		DATE/TIME:	
RELINQUISHED BY (SIGNATURE):				DATE/TIME:		RECEIVED BY (SIGNATURE):		DATE/TIME:	
Distribution: Original accompanies shipment; copy to master file									

**APPENDIX C**

**FIELD ACTIVITY SHEETS**



MABBETT  
CAPACCIO  
& ASSOCIATES, INC.

CONSULTANTS AND ENGINEERS  
5 Alfred Circle Bedford, Massachusetts 01730

FIELD ACTIVITY  
LOG  
SHEET

PROJ. LHT-MEL-ROSE

PROJ. NO. 87024.03

ACTIVITY  
NO.

PRESENT AT SITE:

CLIENT: MIKE NELSON - EARL CARLSON

BOB SHALEK -

CONTRACTORS: PETER DAHLBERG - DAHLBERG CONST.

BARRY THOMASSON - DAG DRILLING

CONSULTANTS: DAN DEIVAN - DAG DRILLING

- ACCURATE CORING, INC.

MCA: GEORGE L. OLSON (GLO)

DATE [START / FINISH]

07/09/90 / 7/13/90

ACTIVITY PUMP HOUSE ASSESSMENT  
CONCRETE CORING, SOIL BORING  
SS-SAMPLING, SCREENING

WEATHER - INTERIOR

DESCRIPTION OF ACTIVITIES:	PERSONNEL	ACTIVITY NUMBER
DRILLING/BORING LOG	GLO	
MONITORING WELL INSTALLATION REPORT	GLO	
TEST PIT LOG	N/A	
FIELD SCREENING SOIL SAMPLES	GLO	
FIELD SCREENING SURFACE WATER	N/A	
MONITORING WELL SAMPLING WORK. SHEET	LATER DATE	
FIELD SAMPLING GROUNDWATER	LATER DATE	
AMBIENT AIR MONITORING	GLO	
SAMPLE CHAIN OF CUSTODY 00480 00481	GLO	
OTHER		







# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-8050

PROJECT/CLIENT	LOCATION	PROJ. NO.
BORING LOCATION	DATE START/FINISH	
GROUND ELEVATION (NGVD)	DRILLED BY	
GROUNDWATER EL./DEPTH	LOGGED BY	DATE

EL.	DEPTH	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
FT.	FT.	TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		

1							8" Concrete slab (6" reinforced mesh)
2							FILL - widely graded sandy gravel, brown
3							
4		SS-1	1 1 2 3	24	10	TIP - 175 ppm	SILTY CLAY - moderately elastic, little fine to medium sand and coarse gravel, brown and black.
5							
6		SS-2	1 1 1 1	24	5.5	TIP - 50 ppm	SILTY CLAY - moderately elastic, trace widely graded sand and gravel, brown and black.
7							
8		SS-3	3 4 6 12	24	22	TIP - 64 ppm	SILTY CLAY - moderately elastic, little medium to coarse sand, gray.
9							
10		SS-4	4 8 14 16	24	24	TIP - 35 ppm	SILTY CLAY - low elasticity, little fine to medium sand, trace widely graded gravel, brown and gray.
11							
12		SS-5	7 13 15 17	24	18	TIP - 15 ppm	SILTY CLAY - SIMILAR TO SS-4.
13							
14							Bottom of Boring - 13'. Backfilled and sealed with bentonite at 11 feet. Well installed at approximately 10' 8".

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D.  
SPLIT SPOON SAMPLER  
PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC - RECOVERY LENGTH OF SAMPLE  
SS - SPLIT SPOON SAMPLE

ROD - LENGTH OF SOUND CORES > 4 IN. / LENGTH CORED, %

GROUNDWATER

INTERFACE

APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-8050

PROJECT/CLIENT		LOCATION		PROJ. NO.	
BORING LOCATION		(B-4)		DATE START/FINISH 7.11.90 / 7.11.90	
GROUND ELEVATION (NGVD)		NA		DRILLED BY	
GROUNDWATER EL./DEPTH		NA - NO WELL INSTALLED		LOGGED BY	
				DATE 7.11.90	
PG. / OF 1					

EL FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		

						8.5" Concrete Slab (6" reinforced mesh)
1						
2						Fill - similar to SS-1
3						
4	SS-1	1 2 2 2	24	7	TIP - 54 ppm	Fill - widely graded gravelly sand, little silt, black, gray and brown.
5						
6	SS-2	2 2 4 9	24	<1	Soil saturated with greenish oil. TIP - 125 ppm	Fill - similar to SS-1
7						
8	SS-3	9 9 9 9	24	13	TIP - 90 ppm	Fill - widely graded gravelly sand, little silty clay, brown and dark gray.
9						
10	SS-4	2 4 7 8	24	1	TIP - 50 ppm	Fill - similar to SS-5
11						
12	SS-5	12 8 13 15	24	20	TIP - 50 ppm	Fill - widely graded sandy gravel, trace silt, brown.
13						
14						Auger refusal at 13'. Suspected concrete hold-down pad. Back filled with natural material. No well installed.

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D.  
SPLIT SPOON SAMPLER  
PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC - RECOVERY LENGTH OF SAMPLE  
SS - SPLIT SPOON SAMPLE

ROD - LENGTH OF SOUND CORES > 4 IN. / LENGTH CORED, %  
⊗ GROUNDWATER  
— INTERFACE  
--- APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-8050

PROJECT/CLIENT	LOCATION	PROJ. NO.
BORING LOCATION	DATE START/FINISH	B-5
GROUND ELEVATION (NGVD)	DRILLED BY	PG. 1 OF 1
GROUNDWATER EL./DEPTH	LOGGED BY	DATE 7.12.90

EL FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
2							7" Concrete slab (6" reinforced mesh)
4		SS-1	4 7 6	24	19	TIP-190ppm #	FILL - sandy silt, some coarse gravel and clay, black and brown.
6		SS-2	1 2 3	24	17	TIP-150ppm #	CLAY - similar to SS-2 Silt - moderately elastic, trace fine to medium sand, brown and gray.
8		SS-3	4 5 6	24	20	TIP-75ppm #	Silt - moderately elastic, trace fine sand and gravel, brown.
10		SS-4	6 8 13	24	24	TIP-115ppm #	Silt - moderately elastic, some widely graded sand and fine gravel, brown.
12		SS-5	11 13 25	24	24	TIP-88ppm #	Silt - low elasticity, trace to little widely graded sand and gravel, trace shale, brown and gray.
14							Silt - clay - similar to SS-5, becoming more elastic with depth.
16							
18							
20		SS-6	4 12 22 22	24	24	TIP-NA	Silt - clay - moderately to highly elastic, trace to little widely graded gravel, gray.
22							BOTTOM OF BORING - 21' Backfilled with natural fill, 2' bentonite seal installed to 8', Well installed at approximately 7'8".

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D.  
SPLIT SPOON SAMPLER  
PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC-RECOVERY LENGTH OF SAMPLE  
SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES > 4 IN./LENGTH CORED, %  
GROUNDWATER  
INTERFACE  
APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-8050

PROJECT/CLIENT _____	LOCATION _____	PROJ. NO. _____
BORING LOCATION _____ (B-6; mca-4)	DATE START/FINISH 7-11-90 / 7-11-90	B-6
GROUND ELEVATION (NGVD) _____	DRILLED BY _____	PG. 1 OF 1
GROUNDWATER EL./DEPTH _____	LOGGED BY _____ DATE 7-11-90	

EL. FT.	DEPTH FT.	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
		TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
1							8" Concrete Slab (6" reinforced mesh)
2							FILL - sandy silt, little widely graded gravel, brown.
3							
4		SS-1	2 2 1 1	24	0	TIP - NA	
5							
6		SS-2	2 3 3 5	24	4	TIP - 40 ppm	FILL - medium sand, little widely graded gravel and silt, light brown.
7							
8		SS-3	3 5 7 8	24	16	TIP - 37 ppm	FILL - widely graded sandy gravel, little silt, grayish brown.
9							
10		SS-4	2 3 4 6	24	13	TIP - 32 ppm	FILL - widely graded sandy gravel, trace silt, brown.
11							
12		SS-5	2 5 7 15	24	20	TIP - 31 ppm	FILL - widely graded gravelly sand, trace silt, light brown.
13							
14							AUGER REFUSAL AT 13'. Suspected concrete hold-down pads. Well installed at approximately 9' 9".

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D. SPLIT SPOON SAMPLER  
PEN - PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
REC - RECOVERY LENGTH OF SAMPLE  
SS - SPLIT SPOON SAMPLE

ROD - LENGTH OF SOUND CORES > 4 IN. / LENGTH CORED, %

✕ GROUNDWATER

—— INTERFACE

----- APPROXIMATE INTERFACE



# MABBETT, CAPACCIO & ASSOCIATES, INC.

CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-8050

PROJECT/CLIENT	LOCATION	PROJ. NO.
BORING LOCATION	DATE START/FINISH	7/13/90 / 7/13/90
GROUND ELEVATION (NGVD)	DRILLED BY	
GROUNDWATER EL./DEPTH	LOGGED BY	DATE 7/13/90

B-7

PG. 1 OF 1

EL	DEPTH	SAMPLE				REMARKS	SOIL AND ROCK DESCRIPTIONS
FT.	FT.	TYPE and NO.	BLOWS PER 6 IN.	PEN IN.	REC IN.		
1							8" Concrete Slab (6" reinforced mesh)
2							
3							
4		SS-1	2 5 4 6	24	20	TIP-NA	SILT CLAY - moderately elastic, little widely graded sand and gravel, brown
5							
6		SS-2	1 2 4 5	24	20	TIP-NA	SILT CLAY - SIMILAR TO SS-1.
7							
8		SS-3	3 7 12 15	24	24	TIP-NA	SILT CLAY - moderately elastic, trace fine sand and widely graded gravel, brown.
9							
10		SS-4	4 11 15 17	24	20	TIP-NA	SILT CLAY - moderately elastic, trace fine sand, brown and gray.
11							
12		SS-5	6 12 17 19	24	24	TIP-NA	SILT CLAY - moderately elastic, trace fine sand and widely graded gravel, brown and gray.
13							
14							BOTTOM OF BORING - 13'. Backfilled and sealed with bentonite to approximately 8'. Well installed at approximately 7'95".

BLOWS PER 6" - 140 LB. HAMMER FALLING 30" TO DRIVE A 2.0 IN. O.D. SPLIT SPOON SAMPLER  
 PEN-PENETRATION LENGTH OF SAMPLER OR CORE BARREL  
 REC-RECOVERY LENGTH OF SAMPLE  
 SS-SPLIT SPOON SAMPLE

ROD-LENGTH OF SOUND CORES > 4 IN./LENGTH CORED, %

GROUNDWATER

INTERFACE

APPROXIMATE INTERFACE



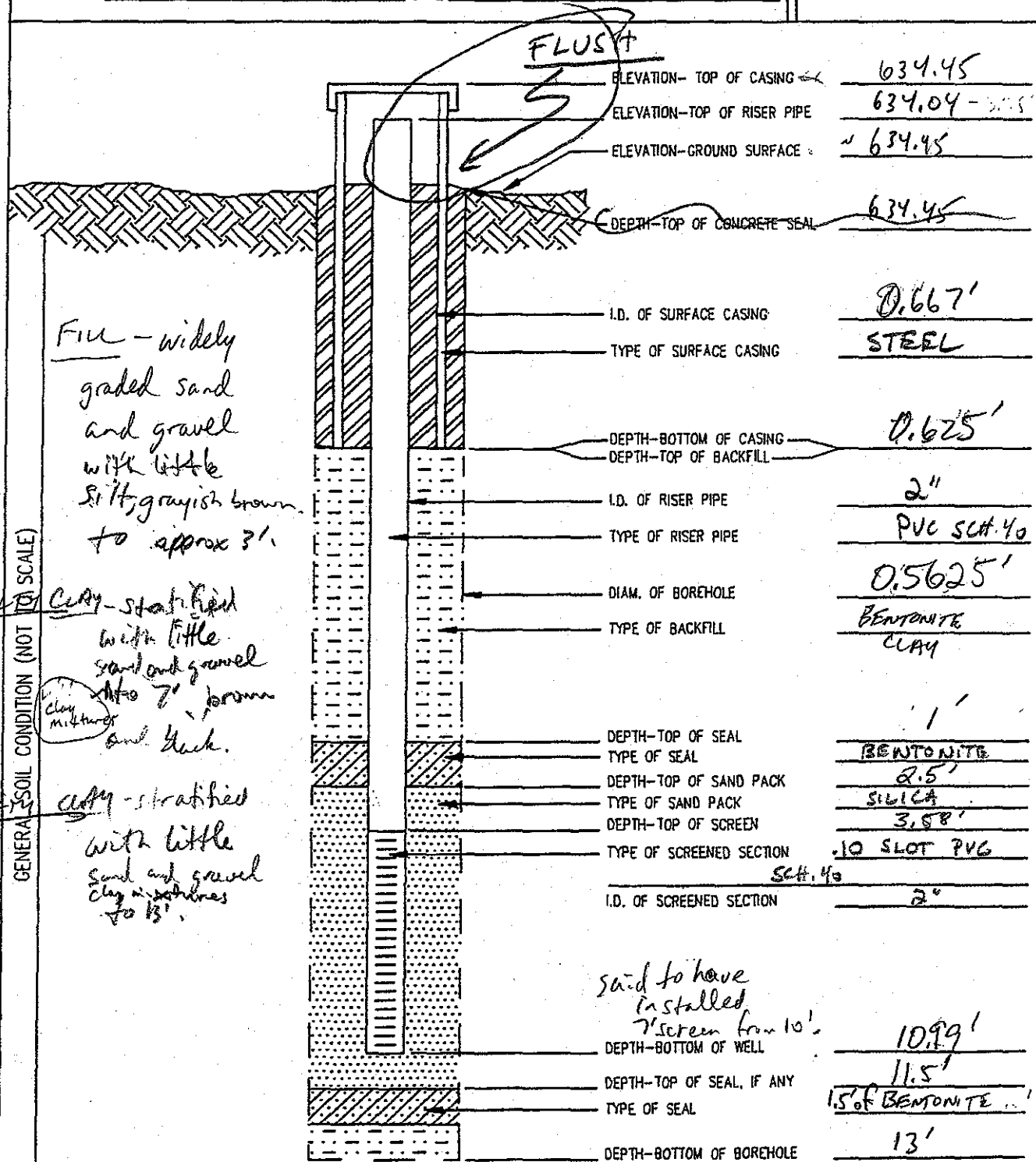
# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-6050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERG PROJ. NO. 87024.03  
 LOCATION 1975 N. Ruby St., Melrose Park, IL  
 CONTRACTOR DEG DRILLING DRILLER B. THOMASSON  
 LOGGED BY GLO DATE 7/13/90  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

MCA-2  
 PG. 1 OF 1  
 BORING NO. B-3  
 LOCATION SEE SITE PLAN





# MABBETT, CAPACCIO & ASSOCIATES, INC.

CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-8050

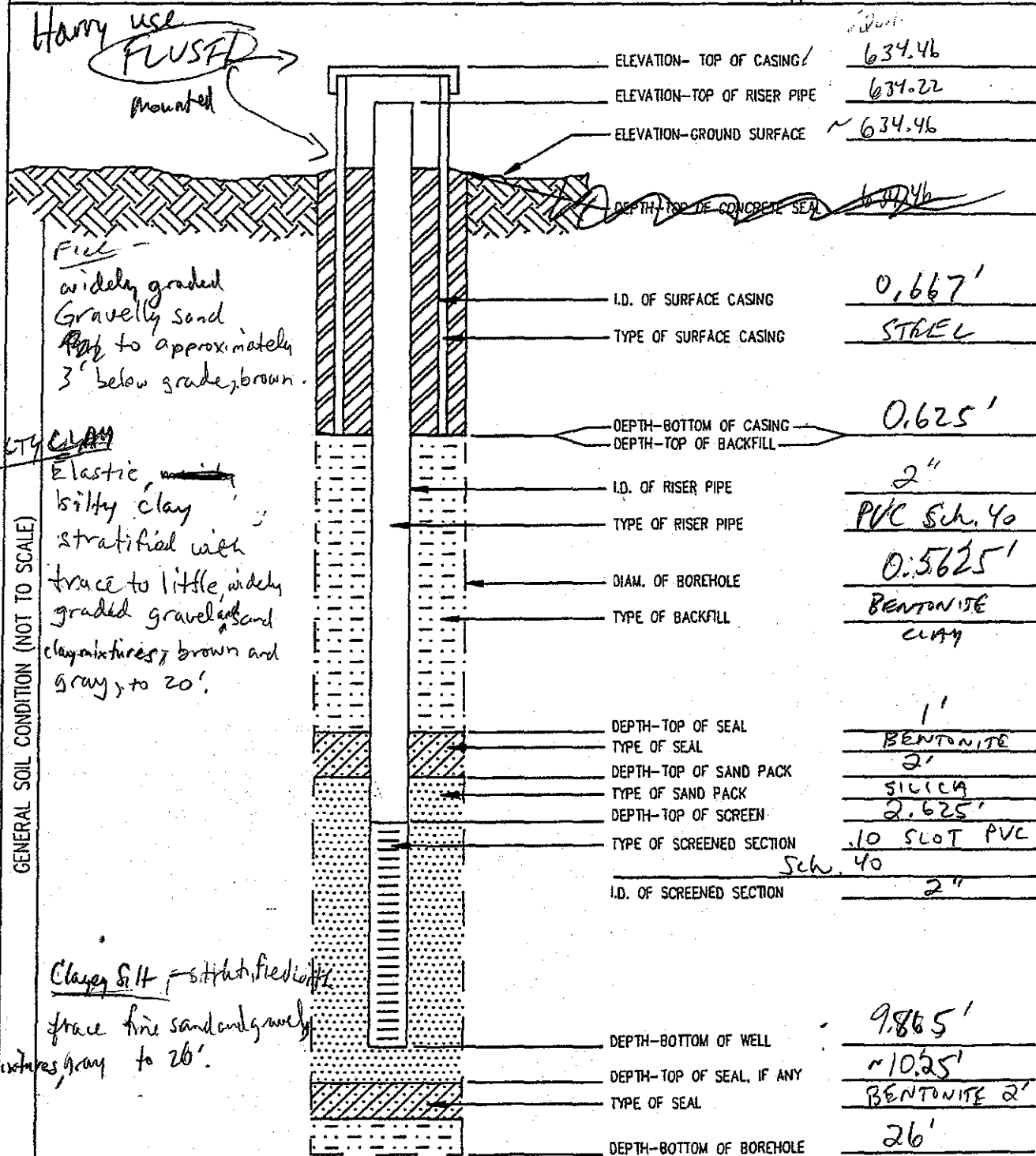
## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERGH PROJ. NO. 8702403  
 LOCATION 1975 N. RIVINGTON ST MELROSE PARK, IL  
 CONTRACTOR D&G DRILLING DRILLER B. THOMASSON  
 LOGGED BY GLO DATE 07/09/90  
 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

MCA-1

PG. 1 OF 1

BORING NO. B-1  
 LOCATION SEE SITE PLAN







# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-6050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CUENT PUMP HOUSE ASSESSMENT / LINDBERG PROJ. NO. 87024.03

LOCATION 1975 N. Ruby St., Melrose Park, Illinois

CONTRACTOR D&G Drilling DRILLER B. THOMASSON

LOGGED BY GLG DATE 7/12/90

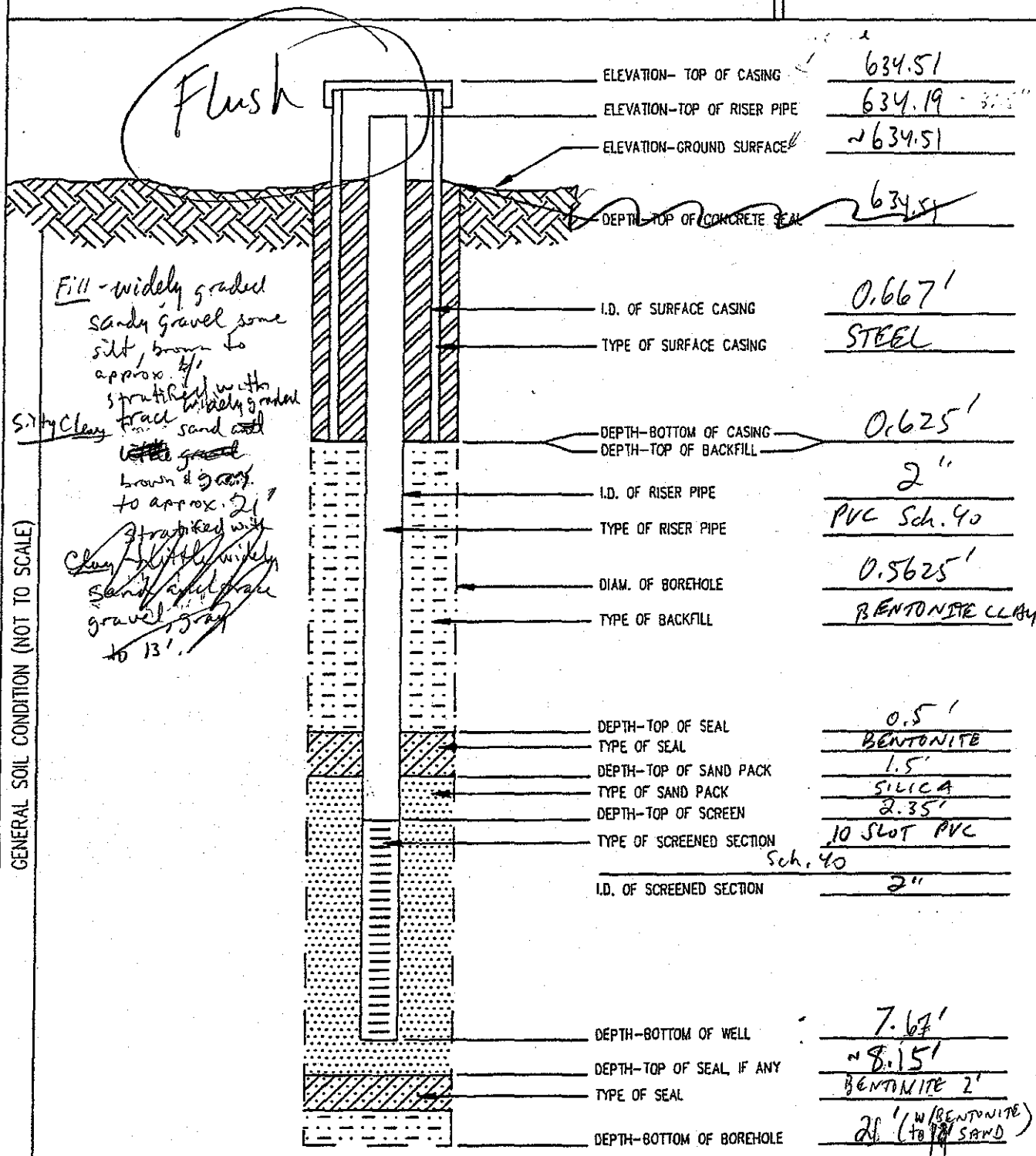
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MCA-3

PG. 1 OF 1

BORING NO. B-5

LOCATION SEE SITE PLAN





# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-6050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT PUMP HOUSE ASSESSMENT / LINDBERG PROJ. NO. 8702403

LOCATION 1975 N. Ruby St., Melrose Park, Illinois

CONTRACTOR D&G Drilling DRILLER B. Thomason

LOGGED BY GLO DATE 7/11/90

CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

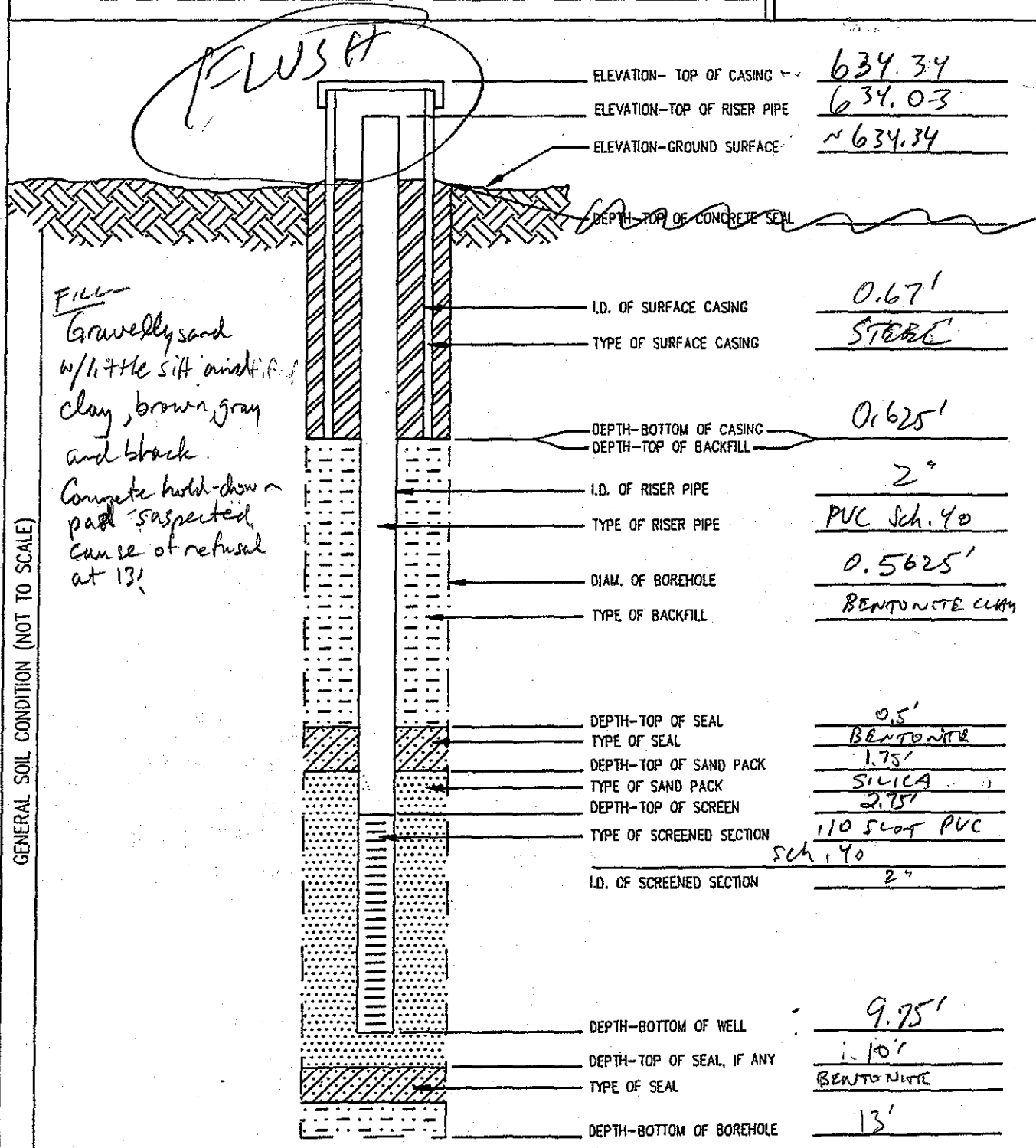
MCA-4

PG. 1 OF 1

BORING NO. B-6

LOCATION SEE SITE

PLAN





# MABBETT, CAPACCIO & ASSOCIATES, INC.

INC. CONSULTANTS AND ENGINEERS 5 Alfred Circle Bedford, Massachusetts 01730 (617)275-6050

## MONITORING WELL INSTALLATION REPORT

PROJECT/CLIENT Pump House Assessment / Lindgren PROJ. NO. 87024.03

LOCATION 1975 N. Ruby St, Melrose Park, IL

CONTRACTOR D&G Drilling

DRILLER B. Thomasson

LOGGED BY Geo

DATE 7/13/90

CHECKED BY

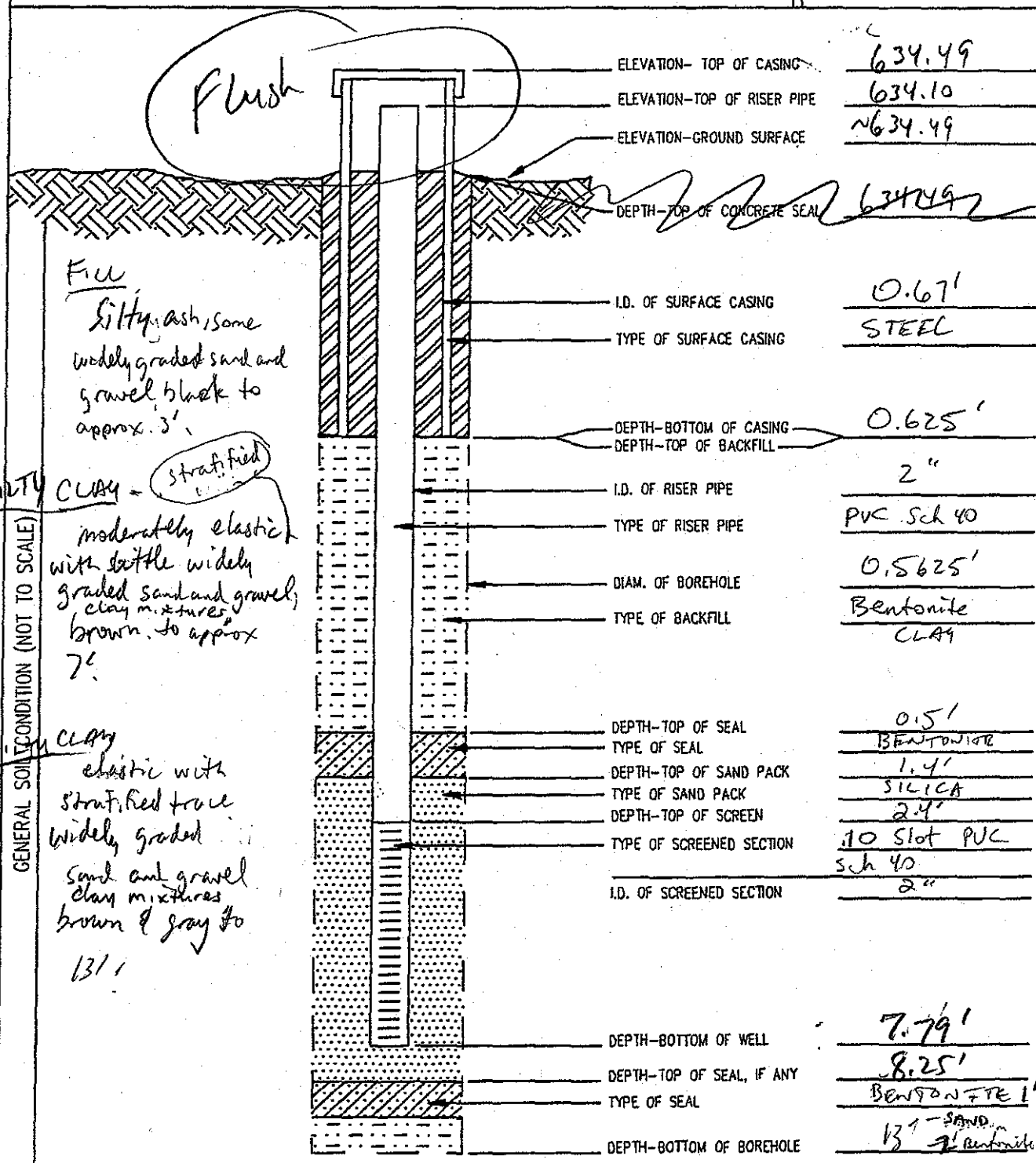
DATE

MCA-5

PG. 1 OF 1

BORING NO. B-7

LOCATION SEE SITE PLAN





MABBETT  
CAPACCIO  
& ASSOCIATES, INC.

CONSULTANTS AND ENGINEERS  
5 Alfred Circle Bedford, Massachusetts 01730

FIELD  
SCREENING  
SOIL SAMPLES

PROJ. LWT-MELROSE  
PROJ. NO. 202403

ACTIVITY  
NO.

SAMPLER: GLO

ANALYST: GLO

DATE

7/9-13/90

SAMPLE					FIELD ANALYSIS				
I.D. NO.	LOCATION	DEPTH INTERVAL (FT.)	DATE	TIME (HRS)	TEMP. °C	SPEC. COND. UMHOS/CM <sup>2</sup>	pH S.U.	TOTAL VOC	COMMENTS
B-1	SS-1	3-5	7-9-90	11:50	Hot	[Handwritten squiggle]	4	4	Blackish material in fill?
1	SS-2	5-7	7-9	12:05	Interior 95°F		3	3	No apparent contamination
1	SS-3	7-9	7-9	12:15			4	4	
1	SS-4	9-11	7-9	12:35			5	5	sides of SS
1	SS-5	11-13	7-9	13:00			5	5	samples wet
1	SS-6	15-17	7-9	13:55			5	5	
1	SS-7	19-21	7-9	14:25			5	5	
1	SS-8	24-26	7-9	15:00			4	4	
B-2	SS-1	3-5	7-13	8:20	Hot	[Large handwritten X]	300?	300?	↑
B-2	SS-2	5-7	7-13	8:35			200?	200?	sight H <sub>2</sub> C odor (apparent)
B-2	SS-3	7-9	7-13	8:45			200?	200?	may be much smaller
B-2	SS-4	9-11	7-13	8:55			210?	210?	only
B-2	SS-5	11-13	7-13	9:05			210?	210?	
B-2	SS-6					[Handwritten squiggle]			
B-2	SS-7								
B-3	SS-1	3-5	7-10	15:40	Hot	[Large handwritten X]	175	175	WET, H <sub>2</sub> C odor
	SS-2	5-7	7-10	15:55			50	50	↓
	SS-3	7-9	7-10	16:20			64	64	Apparent leachate running down sides of samples (SS)
	SS-4	9-11	7-10	16:40			35	35	↓

NOTES:



MABBETT  
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CONSULTANTS AND ENGINEERS  
5 Alfred Circle Bedford, Massachusetts 01730

FIELD  
SCREENING  
SOIL SAMPLES

PROJ. HT-MALROSE  
PROJ. NO. 87024.03

ACTIVITY  
NO.

SAMPLER:

GLO

ANALYST:

GLO

DATE

7/9/90

SAMPLE					FIELD ANALYSIS				
I.D. NO.	LOCATION	DEPTH INTERVAL (FT.)	DATE	TIME (HRS)	TEMP. °C	SPEC. COND. UMHOS/CM <sup>2</sup>	pH S.U.	TOTAL VOC	COMMENTS
B-3	SS-5	11-13	7-10	12:00	—	—	—	15	—
	SS-6	15-17							
	SS-7	19-21							
B-4	SS-1	3-5	7-11	11:00	X	X	X	54	
	SS-2	5-7	7-11	11:10				125	HC odor
	SS-3	7-9	7-11	11:25				90	↓
	SS-4	9-11	7-11	11:40				50	slight
	SS-5	11-13	7-11	11:45				50	↓
B-5	SS-1	3-5	7-12	11:05	X	X	X	190?	No HC odor
	SS-2	5-7	7-12	11:20				180?	
	SS-3	7-9	7-12	11:35				75?	
	SS-4	9-11	7-12	11:50				145?	
	SS-5	11-13	7-12	12:00				88?	
	SS-6	19-21	7-12	12:30				α	↓
B-6	SS-1	3-5	7-11	11:00	X	X	X		No Recovery
	SS-2	5-7	7-11	14:35				40	light HC odor
	SS-3	7-9	7-11	14:40				37	slight odor
	SS-4	9-11	7-11	14:55				32	no odor

NOTES:

MABBETT  
CAPACCIO  
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**CONSULTANTS AND ENGINEERS**  
5 Alfred Circle Bedford, Massachusetts 01730

FIELD  
SCREENING  
SOIL SAMPLES

PROJ. LHT-Melba  
PROJ. NO. 87024.03

ACTIVITY  
NO.

SAMPLER:

Go

ANALYST:

Gu

DATE \_\_\_\_\_

T/9-13/50

[illegible]

NOTES:



MABBETT  
CAPACCIO  
& ASSOCIATES, INC.  
CONSULTANTS AND ENGINEERS  
5 Alfred Circle Bedford, Massachusetts 01730

# AMBIENT AIR MONITORING

PROJ. LHT-MELROSE  
PROJ. NO. 87024.03

ACTIVITY  
NO.

SAMPLER:

GLO

ANALYST:

GLO

DATE

7/9-90  
1/13/90

## SAMPLE

## FIELD ANALYSIS

NO.	LOCATION	DATE	TIME (HRS)	TEMP. C	WIND DIRECTION	TOTAL VOC/CO	COMMENTS
B-1	OUTSIDE PUMP HOUSE (P.H.)	7-9-90	~12:00N			NA / 0.5 ppm	TIP READING ERATIC (3)
B-1	OUTSIDE P.H.	7-9-90	14:30			NA / 0.5	" (2.8)
B-2	OUTSIDE P.H.	7-10-90	~12:00N			0.9 / 0.5	
B-3	OUTSIDE P.H.	7-10-90	15:55			0.7 / X	
B-3	OUTSIDE P.H.	7-10-90	16:45			0.8 / X	
B-4	IN P.H.	7-11-90	11:05			1.0 / 60	CO value above TLV of 50 ppm. Reversed fan to pull air out of room.
B-4		7-11-90	11:40			1.5 / 5	Drillers took 5 min break. CO below 50ppm. Asked drillers if o.k., yes, continued.
B-6		7-11-90	14:20			0.4 / X	
B-6		7-11-90	14:50			1.1 / 5	
	Pump House (P.H.)	7-12-90	8:30 am			1.3 / 5	
	P.H.	7-12-90	13:00			X / 8	
B-7		7-13-90	10:00 A			0.9 / 0.5	
						/	

NOTES:



MABBETT  
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FIELD ACTIVITY  
LOG  
SHEET

PROJ. LHT-MELROSE ACTIVITY  
NO.  
PROJ. NO. 8702403

PRESENT AT SITE:

CLIENT: Mike Nelson Earl Carlson Bob Shalek

CONTRACTORS: NONE

CONSULTANTS:

MCA: GLO

DATE [START / FINISH]

09.6.90 / 09.6.90

ACTIVITY

GW Sampling  
PUMP HOUSE ASSESSMENT

WEATHER

INTERIOR

DESCRIPTION OF ACTIVITIES:	PERSONNEL	ACTIVITY NUMBER
DRILLING/BORING LOG		
MONITORING WELL INSTALLATION REPORT		
TEST PIT LOG		
FIELD SCREENING SOIL SAMPLES		
FIELD SCREENING SURFACE WATER		
MONITORING WELL SAMPLING WORK SHEET	<u>GLO</u>	
FIELD SAMPLING GROUNDWATER	<u>GLO</u>	
AMBIENT AIR MONITORING		
SAMPLE CHAIN OF CUSTODY ( <u>see lab reports</u> ) <u>MCA No. 00754</u>	<u>GLO</u>	
OTHER		



**CONSULTANTS AND ENGINEERS**  
5 Albert Circle, Bedford, Massachusetts 01730

**MABBETT  
CAPACCIO  
& ASSOCIATES, INC.**

# MONITORING WELL SAMPLING

PROJ. LHT-MELKOSÉ <sup>ACTIVITY</sup> Phen

PROJ. NO. 87024.03

ACTIVITY NO. *12*

**SAMPLER:**

60

from top of  
A/C well pipe

ANALYST:

60

DATE \_\_\_\_\_

9.6.90

[illegible]

NOTES:

1. 2" ID WELL HOLDS 0.163 GALLONS/LINEAR FOOT  
1.5" ID WELL HOLDS 0.092 GALLONS/LINEAR FOOT.
2. 1 GALLON = 231 CUBIC INCHES



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CONSULTANTS AND ENGINEERS  
5 Ashford Circle Bedford, Massachusetts 01730

# FIELD SCREENING GROUNDWATER

PROJ. LHT-Melrose  
PROJ. NO. 87024.03

ACTIVITY  
NO.

SAMPLER: GLO

ANALYST: GLO

DATE 9.6.90

PURGE METHOD	PURGE VOLUME		FIELD ANALYSIS				
SAMPLING METHOD	NUMBER OF WELL VOLUMES REMOVED	CUMULATIVE VOLUME PURGED (GALLONS)	TEMP. °C	SPEC. COND. µMHOS/CM	pH S.U.	TOTAL VOC	COMMENTS
WELL NO. (B-1) MW-1 (MCA-1)	1	1.0	24.9	6.84	1030		Brown-gray sediment slow recharge
WELL VOLUME: 0.97 gals	2	2	24.3	6.96	1030		
TIME: 11-11:40	3	2.9 dry	24.3	6.92	1025		
WELL NO. (B-5) MW-3 (MCA-3)	1	0.75	26.8	7.03	1120		Grayish-tan sediment slow recharge
WELL VOLUME: 0.64 gal	2	1.4	27.4	7.14	1120		(little sediment)
TIME: 11:45-12:10	3	2.2	25.7	7.06	1110		
WELL NO. (B-6) MW-4 (MCA-4)	1	1.1	28.2	7.11	900		tanish sediment (v. little) v. slow recharge
WELL VOLUME: 1.04 gal	2	1.6 dry	25.8	7.23	885		
TIME: 12:15-12:55	3	2.1 dry	25.8	7.20	870		
WELL NO. (B-7) MW-5 (MCA-5)	1	0.11	28.3	7.03	3580		1. yellowish v. little to no silt
WELL VOLUME: (0.08 gal)	2	0.2 Dry	28.2	6.99	3520		v. slow recharge
TIME: 14:15-15:25	3	0.3 Dry	28.5	7.23	3500		

## NOTES:

1. WELL VOLUMES TAKEN FROM "MONITORING WELL SAMPLING" WORKSHEET.



CONSULTANTS AND ENGINEERS  
5 Alfred Circle Bedford, Massachusetts 01730

MABBETT  
CAPACCIO  
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# FIELD SCREENING GROUNDWATER

PROJ. L.H. McVose

PROJ. NO. 87024.03

ACTIVITY  
NO.

SAMPLER: GLO

ANALYST: GLO

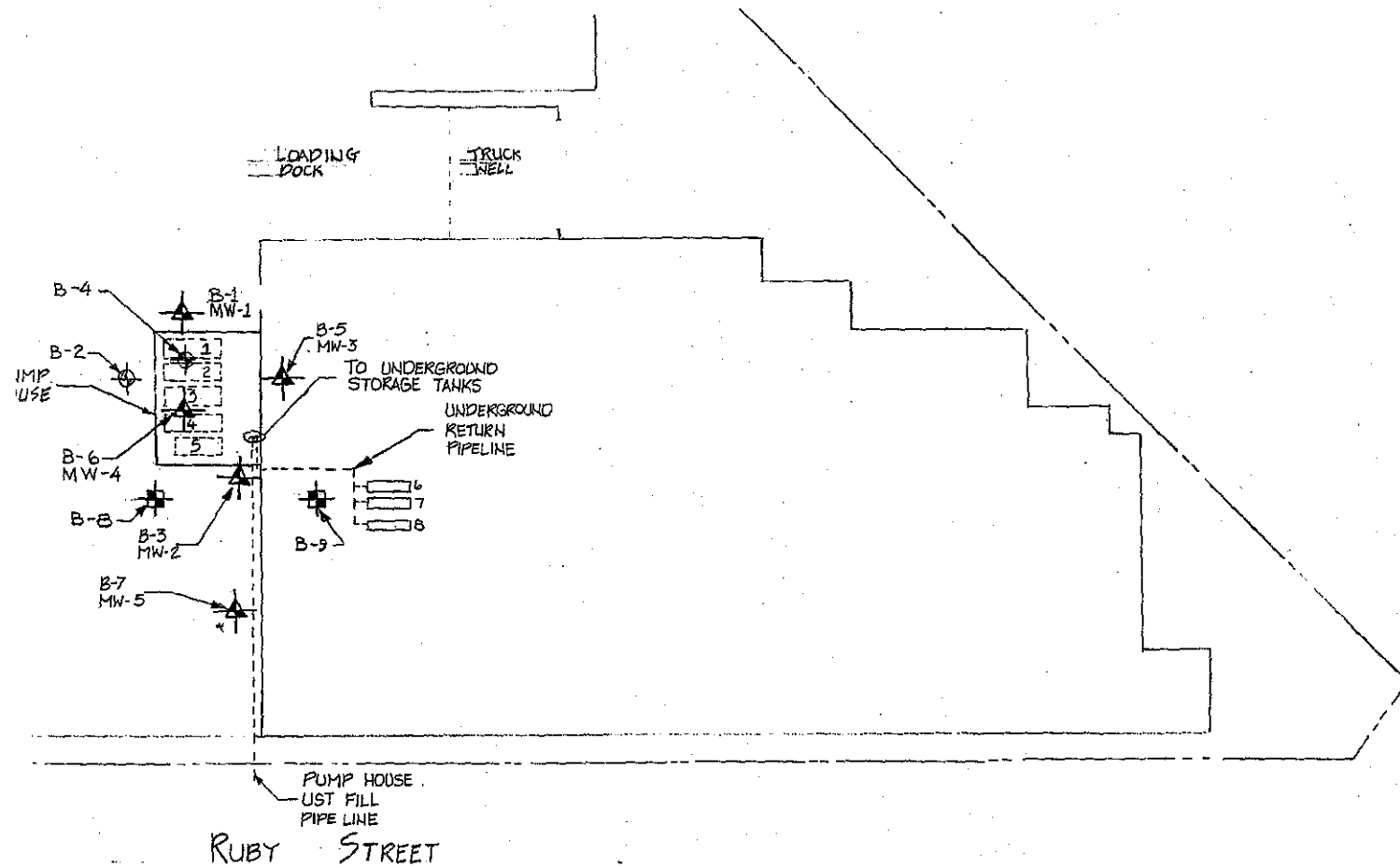
DATE 09.6.90

PURGE METHOD	PURGE VOLUME		FIELD ANALYSIS				
SAMPLING METHOD	NUMBER OF WELL VOLUMES REMOVED	CUMULATIVE VOLUME PURGED (GALLONS)	TEMP. °C	SPEC. COND. µMHOS/CM	pH S.U.	TOTAL VOC	COMMENTS
WELL NO. (B-2) MW-2 (MCA-2)	1	1.1	27.1	6.86	1040	}	n 4 <sup>th</sup> Free Product (Drum Oil)
WELL VOLUME: 1.09 gal	2	2.2	27.1	6.91	1000		↓
TIME: 15:30 - 16:15	3	3.3	27.2	6.92	1020		
WELL NO.							
WELL VOLUME:							
TIME:							
WELL NO.							
WELL VOLUME:							
TIME:							
WELL NO.							
WELL VOLUME:							
TIME:							

## NOTES:

1. WELL VOLUMES TAKEN FROM "MONITORING WELL SAMPLING" WORKSHEET.

CONTOUR INTERVAL 5 FEET  
DATUM IS MEAN SEA LEVEL



2	11/2/90	FOR REGULATORY REVIEW	HSW	GLO	REL
1	2/1/90	FOR REGULATORY REVIEW	HS	GLO	LEL
NO.	DATE	DESCRIPTION	DRN	CHK	APP
REVISION					

